BULLETIN OF MISCELLANEOUS INFORMATION No. 7 1927
ROYAL BOTANIC GARDENS, KEW

XXXIII.—THE GENERA OF MAGNOLIEAE. J. E. Dandy.

While carrying out a critical study of the *Magnoliaceae* (sensu stricto)* with a view to their taxonomic revision, I have come to the conclusion that much of the confusion which for a long time has existed in this group is due to the various interpretations of the limits of the genera. If the very distinct genus *Liriodendron* be left out of consideration—and in my opinion it should be set apart as the tribe *Liriodendreae*†—the remainder of the family, forming the true *Magnolieae*, is an extremely natural group, about the number of whose constituent genera there has never been uniformity of opinion. Up to the time of publication of the "Genera Plantarum" about ten genera had been described by various authors. Of these Bentham and Hooker‡ retained four: *Talauma*, *Magnolia*, *Manglietia*, and *Michelia*; Prantl§ further reduced the number to three by including *Manglietia* under *Magnolia*. Meanwhile Baillon in his "Mémoire sur la Famille des Magnoliacées"|| had suggested two possible alternatives, either to unite all the genera as subgenera of one genus, or to keep up all the ten genera and perforce describe others on single and unimportant characters to cater for isolated species¶. Baillon himself chose the former course, and arranged the genera under five sections of the one genus *Magnolia***.

Through the kindness of those in charge of the various herbaria, I have been able to assemble at Kew for the first time the type-specimens of nearly all the species of the tribe. A study of these in conjunction with the mass of material now available has convinced me that Baillon's "unigeneric" view is untenable, both on taxonomic grounds and also from a utilitarian standpoint in that it necessitates a large and unwieldy genus. Its rejection on the other hand involves, to my mind, the recognition of nine genera, a number less unreasonable than Baillon's second alternative would have us believe.

In deciding which genera should be retained, it is convenient to start with the four recognised by Bentham and Hooker††, all of which are sound. The subsequent reduction of *Manglietia* to *Magnolia* by Baillon and by Prantl was the product of a mechanical

* Hutch. in Kew Bull. 1921: 185; Fam. Flowering Pl. 1: 81 (1926). † Reichb. Handb.: 278 (1837). Spach (Hist. Nat. Veg., Phan. 7: 486 (1839)) also isolated this genus as *Liriodendrineae*. ‡ Benth. et Hook. f. Gen. Pl. 1: 18–19 (1862). § Engl. et Prantl Nat. Pflanzenf. 3, 2: 16 (1888). || Baill. Adansonia 7: 1 (1866). ¶ l.c.: 3. ** l.c.: 66. †† l.c.

process which should not be introduced into taxonomy, for it was reasoned that since a difference in ovule-number was not considered sufficient grounds for the division of *Michelia* into two genera, then *Manglietia* should not be regarded as generically distinct from *Magnolia*. Actually, neither the biovulate nor the pluriovulate Michelias form an homogeneous group, whereas the species of *Manglietia* are a natural assemblage whose members can be recognised from their appearance alone.

Bentham and Hooker, and later Prantl, followed Miquel* in reducing *Aromadendron* to *Talauma*. This was quite erroneous; *Aromadendron* is much further removed from *Talauma* than are *Manglietia* and *Magnolia*, and shows closest affinities with such species as *Magnolia Gustavii* and its allies; it differs from *Talauma* in (1) the indehiscent fleshy fruiting carpels, (2) the free stipules, (3) the elongated peduncle, (4) the numerous tepals, and (5) the long connective-appendage. It was recently revived as a genus by Ridley†.

To the five genera *Talauma*, *Manglietia*, *Magnolia*, *Aromadendron*, and *Michelia*, I find it necessary to add four new ones. Of these *Kmeria* is based upon perhaps the most remarkable plant in the tribe, i.e. *Magnolia Duperreana*, which has unisexual flowers and a mode of dehiscence of the carpels quite unknown in the rest of the family. There is little doubt that if Pierre had not been following Baillon in his recognition of but one genus, he would have founded a new genus for this plant; as it was, he made a new subgenus *Kmeria*‡ for its reception.

Pachylarnax, the second new genus, is based upon a species hitherto undescribed. Two flowering specimens at Kew, both from Penang, had previously suggested that the plant was a new and very distinct species of *Manglietia*, but additional material from the Paris herbarium, collected in Annam, shows that the fruit is capsular and therefore unique in the family. The two or three carpels are united in the mature fruit, which dehisces completely along the back of the carpels and partially along their line of union, forming two or three thick woody valves which become recurved and bifid at the tip; each valve thus consists of two halves of adjacent carpels. Although the Penang specimens are in flower only, and the Annam plant possesses only fruit, they are otherwise identical, and the structure of the gynaecium in the Penang specimens agrees well with the character of the fruit in the example from Annam.

By the separation of *Michelia Cathcartii* as a new genus *Alcimandra*, the genus *Michelia* is converted into a well-defined group with constantly axillary flowers. *Michelia Cathcartii* was apparently originally referred to *Michelia* on account of the stipitate gynaecium and character of the fruit. There, however, the

* Miq. Ann. Mus. Bot. Lugd.-Batav. 4: 70 (1868). † Ridl. Fl. Mal. Penins. 1: 17 (1922).

‡ Pierre Fl. For. Cochinch. 1: sub t. 1 (1879).

resemblance ends, and the plant is more correctly placed near *Magnolia Gustavii* and *Aromadendron*.

The fourth proposed new genus, *Elmerrillia*, embraces a group of very closely allied species confined to the Eastern Malayan Islands from Borneo and the Philippines to New Guinea. The plants resemble some species of *Michelia* in general appearance and in the axillary flowers, but differ in the sessile gynaecium and introrsely dehiscent anthers, while the stipules are always quite free from the petiole. The generic position of these plants has been so puzzling that two of the species have been described independently in each of the genera *Talauma* and *Michelia*, a third was described as a Talauma, while the fourth was referred to *Michelia*.

I append a key to the genera of the tribe together with descriptions of the new genera and a list of new names and combinations which it is found necessary to make.

Key to the Genera.

Flowers bisexual; mature carpels circumscissile or dehiscent along the dorsal suture, or indehiscent:
- Flowers terminal (rarely some also subaxillary):
  - Carpels usually numerous; fruit not capsular:
    - Mature carpels woody or coriaceous, dehiscent; tepals usually fewer than 18; connective-appendage usually much shorter than the anther:
      - Mature carpels free or concrescent, circumscissile, the upper portions falling away independently or in irregular masses and leaving the persistent lower portions with their suspended seeds; stipules adnate to the petiole, leaving a scar on its upper surface.....1. *Talauma*.
      - Mature carpels free, dehiscent along the dorsal suture:
        - Gynaecium sessile or shortly stipitate, exserted from the androecium:
          - Ovules 4 or more.....2. *Manglietia*.
          - Ovules 2.....3. *Magnolia*.
        - Gynaecium stipitate, narrowly cylindrical, not exserted from the androecium; peduncle elongated, slender; tepals 9, subequal; ovules about 2–5; stipules free from the petiole, the latter therefore unscarred.....4. *Alcimandra*.
    - Mature carpels concrescent, fleshy, indehiscent; peduncle elongated, fairly slender; tepals 18 or more; connective-appendage about as long as or longer than the anther; ovules 2; stipules free from the petiole, the latter therefore unscarred.....5. *Aromadendron*.
  - Carpels 2–3, concrescent; fruit capsular, woody, dehiscing completely along the dorsal suture of the carpels and partially along their line of junction; tepals 9, subsimilar; ovules several; stipules free from the petiole, the latter therefore unscarred.....6. *Pachylarnax*.

Flowers axillary :

Gynaecium sessile ; anthers introrsely dehiscent ; stipules free from the petiole, the latter therefore unscarred..... *7. Elmerrillia.*

Gynaecium stipitate ; anthers latrorsely dehiscent..... *8. Michelia.*

Flowers unisexual, terminal ; tepals 6 ; gynaecium sessile ; ovules 2 ; mature carpels free, woody, completely dehiscent along the ventral suture, partially so along the dorsal suture and thus finally bifid at the apex ; stipules adnate to the petiole, leaving a scar on its upper surface.....*9. Kmeria.*

Alcimandra *Dandy*, gen. nov.

Tepala 9, subaequalia. *Stamina* numerosa ; filamentum breve ; anthera linearis, longissima, introrse dehiscens ; connectivum in appendicem brevem linguiformem productum. *Gynaecium* stipitatum, anguste cylindricum, ex androecio haud exsertum ; carpella numerosa ; ovula circiter 2–5. *Fructus* cylindricus, saepe curvatus ; carpella matura libera, laxe disposita, coriacea, ad suturam dorsalem dehiscentia. *Semina* 1–4, libera, omnino arillata, funiculo filiformi suspensa.—*Arbor*. *Folia* integra ; petiolus ecicatrisatus ; stipulae a petiolo liberae. *Flores* solitarii, terminales, bisexuales ; alabastrum in spatha unica intervallo nullo sub tepalis inserta inclusum ; pedunculus elongatus, gracilis.

Species 1 :

Alcimandra Cathcartii (*Hook. f. et Thoms.*) *Dandy*, comb. nov. ; *Michelia Cathcartii* Hook. f. et Thoms. Fl. Ind. 1 : 79 (1855).—Sikkim to Assam and Upper Burma, and Tongking.

Pachylarnax *Dandy*, gen. nov.

Tepala 9, subsimilia, interiora minora basi angustatiora. *Stamina* numerosa ; filamentum brevissimum ; anthera linearis, introrse dehiscens ; connectivum in appendicem brevem productum. *Gynaecium* sessile ; carpella 2–3, concrescentia ; ovula plura. *Fructus* capsularis, lignosus, et ad suturas carpellorum dorsales omnino et ad commissuras partim ita dehiscens ut valvas 2–3 crassas recurvas apice bifidas praebeat. *Semina* in carpellis singulis 2–3, libera, funiculo filiformi suspensa.—*Arbor*. *Folia* integra ; petiolus ecicatrisatus ; stipulae a petiolo liberae. *Flores* solitarii, terminales, bisexuales ; alabastrum in spatha unica intervallo brevissimo sub tepalis inserta inclusum ; pedunculus crassus, brevis.

Species 1 :

Pachylarnax praecalva *Dandy*, sp. nov.

Arbor ; ramuli glabri. *Folia* oblanceolato- vel anguste elliptico-oblonga vel oblanceolata, basi cuneata vel attenuata, apice obtusa vel rotundata saepe emarginata, usque ad 19 cm. longa et 6·5 cm. lata, coriacea, utrinque glabra nitida, subtus in sicco laxe reticulata ; nervi laterales utrinsecus circiter 12–15, inconspicui ; petiolus usque ad 2·5 cm. longus, glaber ; stipulae glabrae. *Pedunculus* circiter

0·5–1 cm. longus, glaber. *Tepala* glabra, exteriora oblanceolato-oblonga circiter 3–3·5 cm. longa. *Stamina* circiter 17–20 mm. longa ; connectivi appendix acuta. *Gynaecium* elongato-obovoideum, glabrum. *Fructus* circiter 5–6 cm. longus.

PENANG. *Haniff* 3485, 4067 (typus in Herb. Kew.).

ANNAM. Tourane Prov. : prope Tourane, Ba-na, 1000 m., *Poilane* (*Inst. Sci. Indoch.*) 7264.

This plant was referred by Ridley* to *Manglietia glauca*, as was also a specimen of *Talauma betongensis* collected on Kedah Peak by Bell and Haniff.

Elmerrillia† *Dandy*, gen. nov.

Tepala 9–15, subsimilia, interiora minora basi angustatiora. *Stamina* numerosa, incurva ; filamentum breve ; anthera linearis, introrse dehiscens ; connectivum in appendicem brevem productum. *Gynaecium* sessile, subcylindricum ; carpella numerosa, conferta ; ovula 2 vel 4. *Fructus* subcylindricus carpellis maturis liberis coriaceis ad suturam dorsalem dehiscentibus, vel suboblongus carpellis maturis concrescentibus carnosis indehiscentibus. *Semina* 1–4, libera, omnino arillata, funiculo filiformi suspensa.—*Arbores*. *Folia* integra ; petiolus ecicatrisatus ; stipulae a petiolo liberae. *Flores* solitarii vel 2–3-nati, axillares, bisexuales ; alabastrum in spathis 2 inclusum, exteriore intervallo manifesto interiore intervallo nullo sub tepalis inserta ; pedunculus elongatus, satis gracilis.

Type-species : *E. papuana* (Schltr.) Dandy.

The following species are referable to this genus :

Elmerrillia papuana (*Schltr.*) *Dandy*, comb. nov. ; *Talauma papuana* Schltr. in Engl. Bot. Jahrb. 50 : 70 (1913) ; *Michelia Forbesii* Baker f. in Journ. Bot. 61, Suppl. : 2 (1923).—New Guinea.

That this plant could not formerly be placed satisfactorily in any genus is shown by the fact that whereas Schlechter referred it with considerable uncertainty to *Talauma*, Baker in describing it independently regarded it as a Michelia.

Elmerrillia celebica (*Koord.*) *Dandy*, comb. nov. ; *Michelia tsiampacca* Miq. Ann. Mus. Bot. Lugd.-Batav. 4 : 73 (1868), an L. ? ; *Michelia celebica* Koord. in Meded. Lands Pl. 19 : 328, 631 (1898).—Celebes.

Elmerrillia pubescens (*Merr.*) *Dandy*, comb. nov. ; *Talauma pubescens* Merr. in Philipp. Journ. Sci., Bot. 3 : 133 (1908).—Philippines.

Elmerrillia ovalis (*Miq.*) *Dandy*, comb. nov. ; *Talauma ovalis* Miq. Ann. Mus. Bot. Lugd.-Batav. 4 : 69 (1868) ; *Michelia*

* Ridl. Fl. Mal. Penins. 1 : 14 (1922).

† After Elmer Drew Merrill, author of one of the species, who has kept up-to-date our knowledge of the Philippine representatives of this often neglected family.

platyphylla Merr. in Philipp. Journ. Sci., Bot. 13 : 11 (1918).—Philippines and Celebes.

The Philippine plant is identical with the type-specimen of Miquel's species. This is another case, as in *E. papuana*, of a member of this genus being described independently in *Talauma* and *Michelia*. The fruit of this species and *E. Vrieseana* differs from that of their congeners in being a syncarp composed of fleshy indehiscent carpels. These species thus afford an interesting parallel with *Michelia Baillonii*, which on account of its fleshy syncarpous fruit has been erroneously referred to *Talauma* and *Aromadendron* (see p. 310 seq.).

Elmerrillia Vrieseana (*Miq.*) *Dandy*, comb. nov. ; *Talauma Vrieseana* Miq. Ann. Mus. Bot. Lugd.-Batav. 4 : 70 (1868).—Celebes.

Miquel referred this species to his section *Aromadendron* of *Talauma*. I have not seen the fruit, and Miquel did not state whether it is terminal or axillary, but the portion of the type which I have seen clearly represents a species closely allied to *Elmerrillia ovalis*, which comes from the same region and possesses a fruit very similar to that of *Aromadendron*.

Kmeria (*Pierre*) *Dandy*, gen. nov. ; *Magnolia* subgen. *Kmeria* Pierre Fl. For. Cochinch. 1 : sub t. 1 (1879).

Tepala 6, subsimilia, interiora minora. *Stamina* numerosa, in axem brevem conicum inserta ; filamentum breve ; anthera linearis, introrse dehiscens ; connectivum in appendicem vix productum. *Gynaecium* sessile ; carpella numerosa ; ovula 2. *Fructus* subglobosus ; carpella matura libera, lignosa, ad suturam ventralem omnino, ad dorsalem etiam partim, dehiscentia, hinc demum apice bifida. *Semina* 1–2, libera, omnino arillata, funiculo filiformi suspensa.—*Arbor*. *Folia* integra ; petiolus supra cicatrisatus ; stipulae petiolo adnatae. *Flores* solitarii, terminales, unisexuales, monoici ; alabastrum in spatha unica intervallo nullo sub tepalis inserta inclusum ; pedunculus satis elongatus.

Species 1 :

Kmeria Duperreana (*Pierre*) *Dandy*, comb. nov. ; *Magnolia Duperreana* Pierre Fl. For. Cochinch. 1 : t. 1 (1879) ; *Talauma Duperreana* Finet et Gagnep. in Bull. Soc. Bot. France 52, Mem. 4 : 32 (1906).—Cambodia.

New Names and Combinations.

Talauma Miqueliana *Dandy*, nom. nov. ; *Manglietia celebica* Miq. Ann. Mus. Bot. Lugd.-Batav. 4 : 72 (1868), non *Talauma celebica* Koord.—Celebes.

Examination of the type-specimen and fruiting material shows that this plant is a Talauma, not a Manglietia, and that it is not Koorders' *Talauma celebica*.

Michelia Scortechinii (*King*) *Dandy*, comb. nov. ; *Manglietia Scortechinii* King in Journ. As. Soc. Bengal 58, 2 : 370 (1889).—Perak and Sumatra.

The axillary flowers, stipitate gynaecium, and pair of ovules all keep this plant out of *Manglietia* and indicate that it is a species of *Michelia*. Material from Sumatra shows that the fruit is a fleshy syncarp somewhat resembling that of *M. Baillonii*.

Michelia Balansae (*Aug. DC.*) *Dandy*, comb. nov. ; *Magnolia Balansae* Aug. DC. in Bull. Herb. Boiss., Ser. 2, 4 : 294 (1904) ; *Michelia baviensis* Finet et Gagnep. in Bull. Soc. Bot. France 52, Mem. 4 : 44, t. 5B (1906).—Tongking.

Magnolia Balansae and *Michelia baviensis* were both founded on Balansa's n. 3886, and the former was the earlier name.

Michelia Martinii (*Léveillé*) *Dandy*, comb. nov. ; *Magnolia Martinii* Léveillé in Bull. Soc. Agric. Sci. Arts Sarthe 59 : 321 (1904) ; *Michelia Bodinieri* Finet et Gagnep. in Bull. Soc. Bot. France 53 : 574 (1906).—China.

The earlier name for this species was that of Léveillé ; it was described independently by him and by Finet and Gagnepain from the same plant (*Martin and Bodinier* n. 2066).

Michelia philippinensis (*P. Parmentier*) *Dandy*, comb. nov. ; *Magnolia philippinensis* P. Parmentier in Bull. Sci. France et Belg. 27 : 206 in obs., 270 (1896) ; *Michelia parviflora* Merr. in Publ. Bur. Gov. Lab. (Philipp.) 35 : 70 (1906), non DC. ; *Michelia Cumingii* Merr. et Rolfe in Philipp. Journ. Sci., Bot. 3 : 100 (1908).—Philippines.

Cuming's n. 783 served as the basis for both Parmentier's and Merrill's descriptions, and Parmentier's name has priority of publication. *Michelia Cumingii* was merely a new name to replace Merrill's *M. parviflora*, which had already been used by de Candolle.

Michelia Leveilleana *Dandy*, nom. nov. ; *Michelia Cavaleriei* Léveillé in Fedde Repert. Sp. Nov. 9 : 459 (1911), non Finet et Gagnep. (1906).—Kweichow.

Léveillé's name had previously been used by Finet and Gagnepain for a very different species.

Magnolia Macklottii (*Korth.*) *Dandy*, comb. nov. ; *Manglietia Macklottii* Korth. in Nederl. Kruidk. Arch. 2, Versl. : 97 (1851) ; *Magnolia ? Pealii* Koord. et Valeton in Meded. Lands Pl. 17 : 148 (1896), non *M. Pealiana* King ; *Magnolia javanica* Koord. et Valeton l.c. : 315 in obs. (1896).—Sumatra and Java.

Comparison of the type-specimens of *Manglietia Macklottii* and *Magnolia javanica* shows them to be identical. The species was correctly referred to *Magnolia* by Koorders and Valeton, who pointed out its affinity with *M. Gustavii* and *M. Pealiana*.

Magnolia poasana (*Pittier*) *Dandy*, comb. nov. ; *Talauma poasana* Pittier in Contrib. U.S. Nat. Herb. 13 : 93 (1910).—Costa Rica.

This is a species of *Magnolia* closely allied to *M. Schiedeana* and *M. guatemalensis*. The petiole is unscarred, a character which serves to distinguish at a glance the species of this group from those of *Talauma*, in which the petiole always bears the scar of the fallen stipules.

Magnolia kachirachirai (*Kanehira et Yamamoto*) *Dandy*, comb. nov. ; *Michelia kachirachirai* Kanehira et Yamamoto in Yamamoto Suppl. Icon. Pl. Formos. 2 : 14, f. 9–10, t. 1 (1926).—Formosa.

The authors referred this species to *Michelia* apparently on account of the stipitate gynaecium ; the flowers and fruit, however, are those of *Magnolia*, and the plant represents a species of the latter genus closely related to *M. nitida*, which also possesses a stipitate gynaecium.

Manglietia kwangtungensis (*Merr.*) *Dandy*, comb. nov. ; *Magnolia kwangtungensis* Merr. in Journ. Arnold Arboret. 8 : 5 (1927) pro parte, excl. spec. n. 12179.—Kwangtung.

Merrill cited three specimens, of which the type (*Canton Christian College* n. 12344) represents a species closely allied to *Manglietia Fordiana*, as he suggested. *Canton Christian College* n. 12179 belongs to a different species, while I have not seen the third specimen (*Canton Christian College* n. 12548).

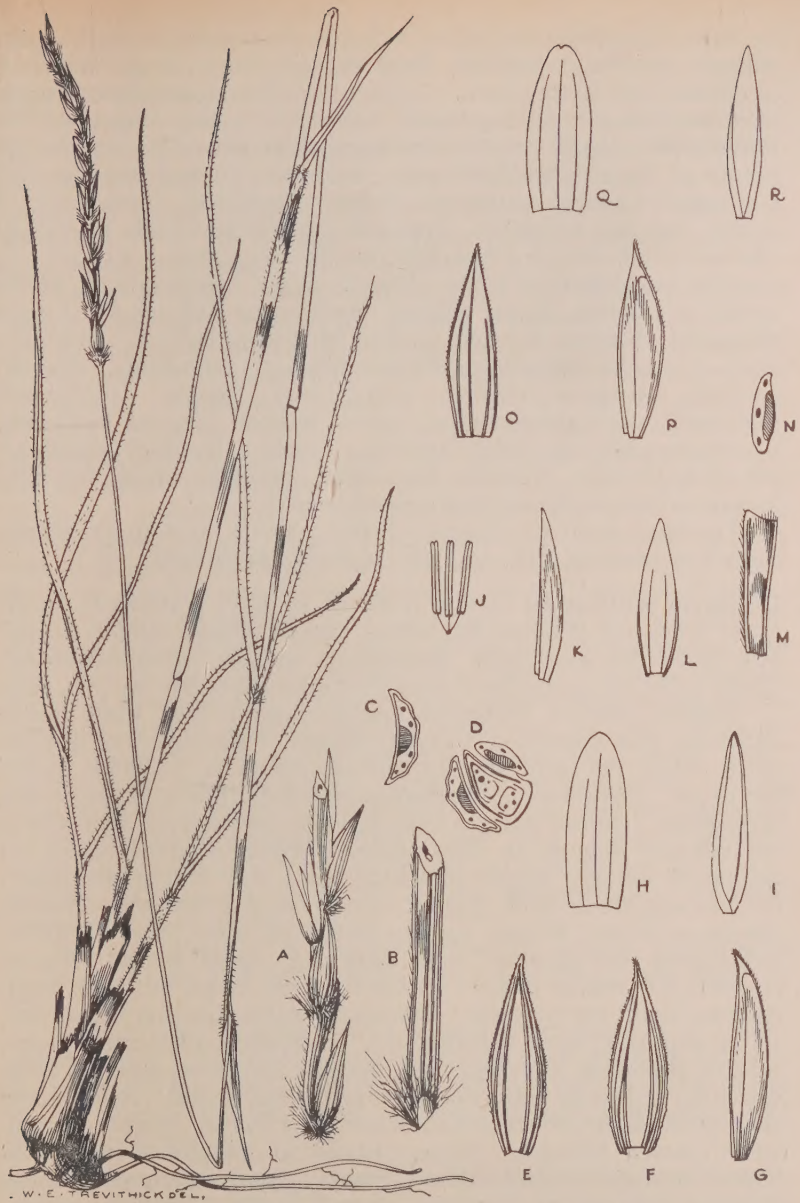
XXXIV.—NOTES ON AFRICAN GRASSES, V*.

New Species.

Lasiurus Maitlandii *Stapf et Hubbard*, sp. nov. ; affinis *L. hirsuto* Boiss., sed culmis erectis caespitosis simplicibus, foliis viridibus flaccidioribusque, ligulis membranaceis, racemis minus densis angustioribusque, articulis oblique truncatis, spiculis minoribus binatis, glumis aequalibus, inferioriore integra, superiore 5-nervia differt.

Gramen perenne, caespitosum, 50–90 cm. altum. *Culmi* erecti, e rhizomate brevi orti, graciles, inferne leviter compressi, superne teretes, simplices, 2–3-nodi, glabri laevesque, vel infra nodos imprimis summos rarius uno latere barbati, innovationibus intravaginalibus. *Foliorum* vaginae arctae vel laxiores, compressae carinataeque, striatae, internodiis breviores, laeves, superiores sparse pubescentes vel glabrae, infimae diu persistentes ; ligulae obtusae vel subacutae, ad 1·5 mm. longae, membranaceae, glabrae vel breviter ciliolatae ; laminae anguste lineares, longe et tenuiter acutae, plicatae vel deinde planae, inferiores 6–16 cm. longae, 2·5–4 mm. latae, superiores multo breviores, virides, laxe patule albo-pilosae, marginibus leviter incrassatis albidis scaberulis. *Racemi* solitarii, erecti, spiciformes, graciles, 5–7 cm. longi, 3–5 mm. lati, fragiles, e vagina summa longe exserti, spiculis binatis ; articuli lineares,

* Continued from *K.B.*, 1927, p. 75.



Lasiurus Maitlandii Stapf et Hubbard, showing habit. A Portion of raceme (×2). B Joint of raceme (×4). C Transverse section of joint. D Diagram of raceme. E and F Lower glume, back, and front-view (×4). G Upper glume, in side-view (×4). H and I Lemma and palea of lower floret (×4). J Stamens (×3). K and L Lemma (side-view) and palea of upper floret (×4). (E–L of sessile spikelet.) M Pedicel (×4). N Section of pedicel. O Lower glume (×4). P Upper glume, side-view (×4). Q and R Lemma and palea of lower floret (×4). (O–R of pedicelled spikelet.)

13–8 mm. longi, breviter ciliati, e dorso convexi, facie concavi, apice oblique truncati; pedicelli lineares, 4–5 mm. longi, adpressi, compressi, uno latere ciliati. *Spiculae sessiles* lanceolato-oblongae, ovato-lanceolatae vel superiores ovatae, 6–8 mm. longae, pallide virides, plerumque purpureo-suffusae, callo pilis albis erectis vel patulis ad 3 mm. longis dense sericeo-barbato. *Glumae* aequales, 6–8 mm. longae; inferior acuminata, integra, subcoriacea, dorso plana vel leviter convexa et glabra, 2-carinata, carinis scaberulis et sursum ciliolatis medio obtuse denticulatis, nervis inter carinas 4, extra eas 2; superior navicularis, a latere oblonga, acuta, membranacea, valide carinata, 3-nervia, apice ciliata. *Anthoecium inferum* ♂; lemma oblongum, obtusum, 6–7 mm. longum, hyalinum, tenuiter 3-nervium, glabrum; palea lanceolata, obtusa, lemmati aequilonga, hyalina, 2-nervia. *Antherae* lineares, 3–3·5 mm. longae. *Anthoecium superum* ♀, infero aequilongum; lemma ovatum, acutum, hyalinum, 3-nervium, glabrum; palea lanceolata, hyalina, lemmati aequilonga vel paulo brevior. *Spiculae pedicellatae* sessilibus similes, 6–7 mm. longae, callo fere glabro, utroque anthoecio ♂.

Tropical Africa. Uganda: Serere; Serere, in stony grasslands subject to burning, 1140 m., July 1926, *Maitland* 1282.

Digitaria Maitlandii *Stapf et Hubbard*, sp. nov.; affinis *D. nardifoliae* Stapf, sed foliorum inferiorum vaginis villosis, laminis latioribus, pedicellis plerumque longioribus, spiculis paulo minoribus, gluma superiore multo breviore emarginata differt (see fig. 2, p. 271).

Gramen perenne, compacte caespitosum, a basi fibris densis obtectum, innovationibus intravaginalibus. *Culmi* erecti vel ascendentes, 25–90 cm. alti, graciles, teretes, simplices, 1–2-nodi, glabri laevesque. *Foliorum* vaginae demum internodiis breviores, superiores laxiusculae, tenuiter striatae, infimae longe persistentes, tomentosae vel villosae, demum in fibras fissae, superiores pubescentes vel glabrae et laeves; ligulae truncatae, ad 1 mm. longae, scariosae; laminae anguste lineares, longe et tenuiter acutae, involutae, demum planae, 4–18 cm. longae, applanatae ad 3·5 mm. latae, rigidulae, pubescentes vel glabrae, facie asperulae, dorso laeves. *Racemi* graciles, 5–8, sessiles in axi communi 2–3 cm. longo, 4–11 cm. longi, flexuosi, erecti vel patentes; rhachis triquetra, tenuiter marginata, ad 0·5 mm. lata, laevis vel scaberula; pedicelli 2–4-nati, inaequales, tenuiter filiformes, 1–5 mm. longi, flexuosi, laeves vel asperuli, apice discoidei. *Spiculae* dense vel demum laxe imbricatae, oblongae vel elliptico-oblongae, acutae vel subacutae, 2–2·25 mm. longae, 0·8 mm. latae, breviter hirsutae. *Gluma* inferior ad marginem subannuliformem delicate hyalinum album reducta; gluma superior orbiculata, truncata, emarginata, 0·75 mm. longa, hyalina, albida, 3-nervia, lineis quaternis pilorum hirsuta, pilis clavatis albis sericeis patentibus exterioribus longioribus. *Anthoecium inferum* sterile; lemma oblongum vel elliptico-oblongum, obtusum, spiculam aequans, 5–7 nervium, tenuiter membranaceum, quoad pubescentiam glumae superiori simile; palea minuta, hyalina, ad 0·75 mm. longa.

Anthoecium superum ♀, oblongum vel elliptico-oblongum, acutum vel acuminatum, spiculam aequans, firme chartaceum, castaneo-fuscum, demum nigro-fuscum.

Tropical Africa. Uganda : Masaka ; Mbarara road, on roadside and in plains, Oct. 1925, *Maitland* 766 (type) : Ruwenzori ; Bwamba, Bulanga, 740 m., Dec. 1925, *Maitland* 928.

Panicum inaequilatum *Stapf et Hubbard*, sp. nov. ; affinis *P. aequinervi* Nees, sed spiculis minoribus, glumis conspicue inaequilatis, inferiore anguste et 3-nervia differt.

Gramen perenne. *Culmi* vagantes, e basi decumbente geniculato-ascendentes, 15–55 cm. longi, debiles, gracillimi, teretes, glabri, laeves, laxe ramosi, multinodi, nodis glabris. *Foliorum* vaginae arctae, teretes, tenuiter striatae, 1·5–6 cm. longae, tenues, ciliatae, sparse pubescentes vel glabrae, internodiis breviores ; ligulae ad seriem ciliorum reductae ; laminae lanceolato-lineares, subauriculatae, tenuiter acutae, 2·5–6 cm. longae, 2·5–6 mm. latae, planae, patentes, tenues, sparse pubescentes vel fere glabrae, tenuiter nervosae et transverse trabiculatae, marginibus minute scaberulis. *Panicula* laxa, 4–7 cm. longa, 1·5–6 cm. lata, plerumque breviter exserta ; rhachis filiformis, laevis, glabra ; rami solitarii, ad 4 cm. longi, pauci, distantes, demum patentes, tenuiter filiformes vel capillares, flexuosi, glabri laevesque ; pedicelli 3–11 mm. longi, apice cupulato-clavati. *Spiculae* ovatae vel ovato-oblongae, acutae vel subacuminatae, 2·5 - 2·75 mm. longae, sparse pubescentes, virides. *Glumae* tenuiter herbaceo-membranaceae, ad marginem et apicem hyalinae, explanatae obtusae ; inferior anguste oblongo-ovata, circ. 2·5 mm. longa, 3-nervia ; superior late oblongo-elliptica, quam inferior duplo latior, circ. 2·75 mm. longa, 7-nervia. *Anthoecium inferum* sterile ; lemma glumae superiori simile sed ellipticum, 2·5 mm. longum, glabrum, 5-nervium ; palea lineari-oblonga, 1·8 mm. longa, hyalina. *Anthoecium superum* ♀, oblongo-ellipticum, subacutum, 1·8–2 mm. longum, albidum, laevissimum ; lemma subcoriaceum. *Antherae* lineari-oblongae, 1·2 mm. longae.

Tropical Africa. S. Rhodesia : Umtali, 1560 m., on hillsides in shade of bush and undergrowth, Feb. 1926, *Herb. Dept. Agric. S. Rhod.* 3375.

Amongst the Tropical African species it is nearest to *P. Hochstetteri* Steud., a native of equatorial Africa, from which it differs in its much weaker culms, thinner, loosely nerved and transversely veined leaves ; simpler, laxer panicles ; equally long, hairy and finely nerved glumes.

Setaria aequalis *Stapf*, sp. nov. ; affinis *S. Thollonii* Stapf (comb. nov. e *Panico Thollonii* Franch.), sed culmis 2–3-nodis, laminis firmioribus majoribusque, spiculis late oblongis, gluma inferiore enervia, superiore 5-nervia anthoecium superum aequante, lemmate inferiore 5-nervio differt.

Gramen annuum, laxe caespitosum, 15–25 cm. altum. *Culmi* tenuiores, suberecti vel geniculatim ascendentes, tenuiter striatae,

laeves glabrique, 2–3-nodi, e nodis omnibus summis exceptis ramosi, ramis suberectis, internodis intermediis 4–5 cm. longis, summo tenuiter filiformi demum longe exserto et ad 12 cm. longo. *Foliorum* vaginae leviter compressae vel superiores teretes, angustae, tenuiter herbaceae, tenuius sulcato-striatae, inferiores mox a culmo solutae, intermediae 2·5–4 cm. longae, ciliolatae et magis minusve sparse tenuiter pubescentes vel glabrae, nodis delicate pubescentibus; ligulae ad seriem ciliorum brevium reductae; laminae lanceolatae, basi magis minusve attenuatae, acutae, 4–7·5 cm. longae, 6–12 mm. latae, planae, basi leviter plicatae, tenues, virides, glabrae vel basi sparse ciliolatae, leviter scaberulae, costa gracillima, nervis primariis 6–8 tenuissimis. *Inflorescentia* paniculata, angusta, magis minusve flexuosa, laxa, 4–5 cm. longa, 6–8 mm. lata; axis filiformis, subteres atque laevis vel sursum versus complanatus et scaberulus; rami oblique erecti, solitarii, distantes, inferiores 1·25–2 cm. longi, tenuiter filiformes, acute angulati, scaberuli, cum seta terminali, spiculas ad 10 subsessiles contiguas vel distantes in racemos subsecundos simplices dispositas gerentes, spiculis plerumque setis solitariis suffultis; setae graciles, rigidulae, 3–6 mm. longae; pedicelli minutissimi, apice truncati. *Spiculae* late oblongae, subobtusae vel acutae, turgidulae, 2·5 mm. longae, 1 mm. latae, virides. *Glumae* inaequales; inferior orbiculata, 0·5 mm. longa, hyalina, enervia; superior anthoecium superum aequans vel paulo brevior, tenuiter membranacea, albida, 5-nervia, nervis viridibus. *Anthoecium inferius* sterile, superum aequans; lemma gluma superiori simile sed complanatum vel leviter depressum; palea oblonga, lemmate multo brevior. *Anthoecium superius* ♂, oblongum, obscure apiculatum, albidum, demum pallide fuscum; lemma et palea crustacea; lemma tenuiter transverse rugosum, apice papilloso-asperulum, paleam granulari-punctatam marginibus late amplectens.

Tropical Africa. Tanganyika Territory: Kilimanjaro; Marangu, 1500 m., *Volkens* 914.

Setaria ramentacea *Stapf*, sp. nov.; affinis *S. homonymae* Chiov., sed ramis paniculae basi setis sterilibus fasciculatis stipatis, spiculis paulo minoribus, gluma superiore longiore angustioreque, anthoecio supero laevi nitidoque differt.

Gramen perenne. *Culmi* moderate graciles, longe ascendentes, nodis ad 9, magis minusve ramosi, parte ascendente compresso, infra paniculam pubescentes, infra nodos molliter retrorso-hirsuti, caeterum glabri laevesque, internodiis intermediis circiter 2.5 cm. longis, superioribus 7·5–15 cm. longis, summo longe exserto ad 35 cm. longo. *Foliorum* vaginae potius tenues, superiores subherbaceae, striatae, inferiores compressae, carinatae, magis minusve hirsutae et saepe ore barbatae vel superiores versus basin retrorso-pubescentes et superne glabrae, intermediae internodiis multo longiores, solutae et superne arcte complicatae; ligulae ad seriem ciliorum densorum reductae; laminae lineares, basi magis minusve attenuatae vel (foliorum superiorum) leviter rotundatae, plerumque longe plicatae,

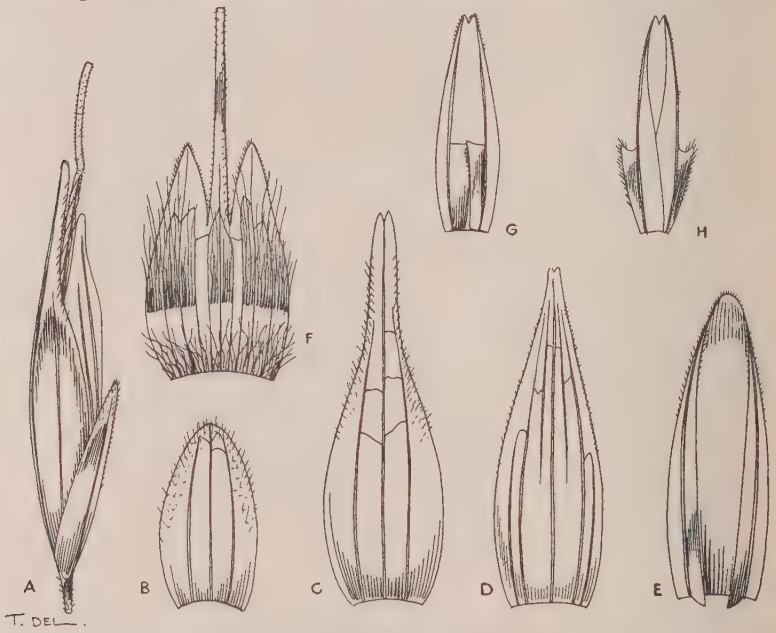
in acumen longe attenuatae, ad 18 cm. longae, 4 mm. latae, demum sursum versus explanatae, virides, laxe hirsutae, costa tenuissima albida, nervis primariis 6–8. *Inflorescentia* paniculata, erecta, 10–12·5 cm. longa, 2·5 cm. lata, praeter basin densiuscula ; axis gracilis, inferne teres, superne angulatus vel sulcatus, scaberulus ; rami distantes, irregulariter approximati vel fere verticillati, infimi ad 4 cm., caeteri ad 1·5 cm. distantes, oblique erecti, inferiores plerumque 2·5–4 cm. longi, superiores 0·75 cm. longi, omnes graciles, stricti vel flexuosi, angulati, scaberuli, cum seta terminali, a basi divisi hic ibique ramulos edentes steriles setas pertenues purpurascentes ad 4 mm. longas magis minusve fasciculatas gerentes, superne in racemos simplices vel basi subcompositos abeuntes, spiculis plerumque contiguis cum vel sine seta fulciente ; setae longitudine varia ; pedicelli tenuiter filiformes, minutissimi vel ad 1 mm. longi, apice subdiscoidei. *Spiculae* oblongae, subacutae, 2–2·5 mm. longae, 1 mm. latae, turgidae, ambitu leviter obliquae, pallide virides, varie purpureo-suffusae. *Glumae* membranaceae ; inferior late ovata, obtusa vel subacuta, circiter 0·75 mm. longa, 5-nervia ; superior ovato-oblonga, subacuta, 1·6–2·2 mm. longa, 5–7-nervia. *Anthoecium inferum* ♂, superum aequans vel paulo longior ; lemma firme membranaceum, late oblongum, subacutum, inter margines tumidos conspicue et anguste depressum, 7-nervium ; palea lemma subaequans, oblonga, acuta, carinis marginatis ; antherae 1·5 mm. longae. *Anthoecium superum* ♀, oblongum, obtusum vel subacutum, albidum vel pallide purpureum ; lemma et palea subcoriacea, nitida, laevia.

Tropical Africa. Uganda : Lugalambo, in thickets, 1200 m., *Dummer* 3099.

Danthoniopsis minor *Stapf et Hubbard*, sp. nov. ; arcte affinis *D. Gossweileri* Stapf, sed omnibus partibus minor, praeterea spiculis vix turgidis, glumis magis obtusis superne pubescentibus, lemmate inferiore minus rostratis diversa.

Gramen perenne caespitosum. *Culmi* erecti, 0·9–1 m. alti, graciles, teretes, simplices, 4-nodi, internodiis inferioribus albido-sublanatis, caeteris sparse pubescentibus vel glabris laevibusque, aut omnibus fere glabris. *Foliorum* vaginae arctae vel basales demum solutae, teretes, leviter striatae, inferiores sublanatae, superiores pubescentes, ciliatae vel glabrae aut omnes fere glabrae laevesque, ad nodos lanato-villosae vel pubescentes, praeter infimas internodiis breviores ; ligulae ad seriem ciliorum reductae, pilis albis ad 1·5 mm. longis ; laminae lineares, ad basem longe attenuatae, tenuiter setaceo-acutae, 7–15 cm. longae, 5–8 mm. latae, firmae, planae vel ad margines involutae, utrinque lanato-pilosae, molliter pubescentes vel glabrae, marginibus cartilagineis scaberulis, uno margine crispo. *Panicula* angusta, densiuscula, 14–17 cm. longa, 1–1·5 cm. lata ; rhachis gracilis, teres, albido-pubescens vel glabra scaberulaque ; rami solitarii vel 2-nati, erecti, ad 4 cm. longi, filiformes, pubescentes vel glabri et scaberuli ; ramuli breves, 1–3-

spiculati ; pedicelli 0·5–3 mm. longi. *Spiculae* lanceolatae vel ovato-lanceolatae, vix turgidulae, 8–9 mm. longae, pallide virides et purpureo-suffusae. *Glumae* membranaceae, prominenter 3-nerviae, superne et ad margines breviter pubescentes, caeterum glabrae ; inferior elliptico-oblonga, obtusa, 4 mm. longa ; superior ovato-oblonga, rostrato-acuminata, brevissime bifida vel integra obtusaque, ad 9 mm. longa. *Anthoecium inferum* ♂ ; lemma 7 mm.



Danthoniopsis minor Stapf et Hubbard. A Spikelet (×7). B Lower glume (×6). C Upper glume (×6). D and E Lemma and palea of lower floret (×7). F Lemma of upper floret (×6). G and H Palea of upper floret (×6).

longum, vix acuminatum, ovato-oblongum, brevissime bifidum, membranaceum, superne 7-nervium, ibique ad margines ciliatum, caeterum glabrum ; palea lineari-oblonga, obtusa, 5·5–6·5 mm. longa, superne ciliolata, carinis anguste et tenuiter alatis ; antherae 2 mm. longae. *Anthoecium superum* ♀ ; callus brevissimus, obtusus, barbatus ; lemma 5–6 mm. longum, late elliptico-oblongum, bilobum, lobis acutis 1·5 mm. longis, membranaceum, 9-nervium, pilorum alborum fasciculis 8 in unam seriem transversam dispositis barbatum et basi pilosum, caeterum glabrum ; arista geniculata, 10 mm. longa ; palea lineari-oblonga, brevissime bifida, 4·5–5·5 mm. longa, carinis e basi ad medium alatis, ala abrupte truncata ciliata, auriculata. *Antherae* 2·5 mm. longae.

Tropical Africa. Rhodesia : Salisbury, 1440 m., Feb., 1921, *Eyles* 2968 (type) ; Feb. 1920, *Henricksen in Herb. Eyles.* 2495.

Diplachne Dummeri *Stapf et Hubbard*, sp. nov. ; affinis *D. fuscae* P. Beauv., sed ligulis truncatis ciliolatis, spiculis brevioribus

angustioribus laxioribus, anthoeciis 3–4, gluma inferiore breviore latioreque, antheris minoribus differt.

Gramen perenne, surculiferum vel primo anno florens et tunc interdum annuum. *Culmi* erecti, 0·6–1 m. alti, moderate validi, striati, inferne subcompressi, caeterum teretes, glabri laevesque, e medio ramosi, 3–6-nodi, nodis glabris. *Foliorum vaginae* valide compressae et carinatae, imprimis basales, solutae, tenuiter striatae, pallidae, glabrae laevesque vel leviter scaberulae, tenuiter chartaceae, internodiis longiores ; ligulae truncatae, circ. 1 mm. longae, membranaceae, ciliolatae ; laminae anguste lineares, 15–20 cm. longae, applanatae ad 3 mm. latae, e basi longe attenuatae, tenuiter acutae, planae, involutae vel convolutae, flexuosae, glabrae,

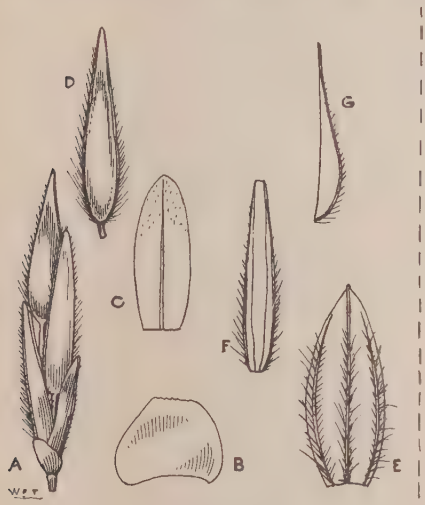


Fig. 1.

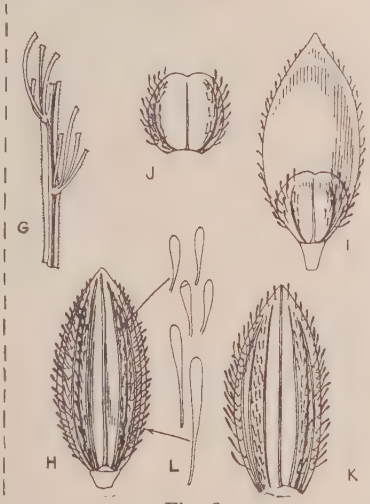


Fig. 2.

Fig. 1. *Diplachne Dummeri* Stapf et Hubbard. A Spikelet (×10). B Lower glume (×10). C Upper glume (×10). D Floret (×8). E Lemma (×8). F and G Palea in front and side-view (×8).

Fig. 2. *Digitaria Maitlandii* Stapf et Hubbard. G Portion of raceme with spikelets removed (×4). H and I Spikelet in back- and front-view (×14) J. Lower glume (×14). K Upper glume (×14). L Hairs of upper glume, much enlarged.

utrinque asperulae vel fere laeves. *Panicula* magis minusve nutans, oblonga, contracta vel demum soluta, 15–25 cm. longa, 2·5–8 cm. lata ; rhachis gracilis, tenuiter striata, scaberula ; rami solitarii, rarius 2-nati, flexuosi, triquetri, scaberuli ; pedicelli 0·25–1 mm. longi. Spiculae 4–6 mm. distantes, lineares vel lineari-lanceolatae, pauciflorae, 5–7·5 mm. longae, 1–1·5 mm. latae, pallide virides vel purpureo-suffusae. *Gluma* inferior 0·75–1 mm. longa, oblata, truncata vel rotundato-truncata, tenuiter membranacea, enervia vel 1-nervia ; gluma superior 2–3 mm. longa, obtusa vel emarginata, 1-nervia. *Anthoecia* 3 vel 4 ; rhachillae internodia 1·5–1·75 mm.

longae; lemma oblongum vel elliptico-oblongum, apice explanato obtusum, truncatum vel leviter emarginatum, breviter mucronatum, 3–4 mm. longum, 3-nervium, ad nervos ad medium breviter pilosum; palea lineari-oblonga, truncata, 3–3·75 mm. longa, carinis ultra medium dense ciliatis. *Antherae* oblongae, 0·5 mm. longae. *Caryopsis* oblonga, 1·3 mm. longa, pallide fusca.

Tropical Africa. Uganda: Nairobi, grassy valley, 1630 m., Feb. 1915, *Dummer* 1981 (type); Bulimezi, Luwelo, edge of swamp, 1110 m., Sept. 1926, *Maitland* 1361.

Uganda Grasses.

By T. D. Maitland and C. E. Hubbard.

An account of the grasses of Uganda in reference to their agricultural uses has not so far been published. A recent collection of plants including numerous grasses having been made in Uganda by Mr. T. D. Maitland, the opportunity is here taken to enumerate them together with the copious notes made by the collector in the field. These notes include valuable first hand observations on the grass flora of Uganda, including information as to their value as forage and their distribution in the colony.

In the text the letter *M* denotes a specimen collected by Mr. Maitland in order to distinguish from others incidentally mentioned. The genera are arranged according to the Flora of Tropical Africa.

A special study of the grasses of Uganda has so far not been undertaken, and the present paper, although it deals with a wide range of grasses is little more than an introduction to the subject. This study has not hitherto been a matter of urgency as there has been no necessity for intensive grazing, owing to the greater part of the stock being owned by the pastoral tribes who have large tracts of land over which to graze. There are therefore no parts very closely grazed except around the villages of the agricultural peasants, who keep a few cattle but have mostly goats and sheep. The native stock-owner consequently does not concern himself with the renewal of his grazing land; he leaves that to nature and seeks fresh pastures further afield. The endeavours now being made among the more intelligent natives to build up good herds by selection and by the introduction of grade stock, and the increasing numbers of cattle owned by Europeans, make the study of the grasses a matter of more urgent importance. In addition there is the imperative need for restricting the movement of stock to prevent the spread of disease; this in many parts would bring about a closer grazing and a need for the maintenance of pasture-land.

There are large tracts of country covered with Elephant Grass (*Pennisetum purpureum* Schum.), which always provide good and ample grazing. But in Uganda this grass has a great disadvantage in that it harbours the *Stomoxys* fly, and it is impossible to keep cattle

in an area heavily infested with this pest. The breeding places of the *Stomoxys* fly consist of decaying vegetable debris, which cannot be satisfactorily controlled in Elephant Grass areas. To make stock rearing profitable and satisfactory these areas would require to be cleared and planted with some of the good grazing short grasses, such as *Brachiaria brizantha* Stapf, *Cynodon plectostachyus* Pilger, *Axonopus compressus* P. Beauv., or mixtures of them.

The real stock-areas of the country are not the tall Elephant Grass tracts, but the short grass areas, like the Ankole plains or open grass country scattered with *Acacias* and the cactoid *Euphorbia* (*E. antiquorum* L.).

With regard to the distribution of the grasses, Elephant Grass is the most dominant on the mainland of the Victoria Nyanza region, where it covers the land from the swamp-levels to well up the hillsides, the higher positions being taken up by "Lusenke" (*Imperata cylindrica* P. Beauv.), although the latter is found to a more or less extent practicaliy everywhere. There is very little Elephant Grass on the Sese group of islands and practically none on the Buvuma group in the north-east of the Victoria Nyanza, where *Trichopteryx kagerensis* K. Schum. is the principal grass and covers large areas. The larger islands, especially, are afforested along the summits, with belts of forests running down the valleys to the edge of the lake; between these valleys the slopes are open stretches of grasses, where *Trichopteryx kagerensis* K. Schum. often occurs in almost pure stands, or is mixed with *Imperata cylindrica* P. Beauv., *Cymbopogon afronardus* Stapf, *Hyparrhenia filipendula* Stapf, *Andropogon canaliculatus* Schum., and *Ctenium elegans* Kunth. *Panicum maximum* Jacq. occurs here as elsewhere in Uganda, about the edges of the forests, near villages, and along the edges of paths.

The Elephant Grass, besides being the most abundant in the Victoria Nyanza region, occurs again in the Ruwenzori area on the western slopes of the mountains, where it forms a great belt up to an altitude of 5,000 feet or more. Towards the northern end of the range near the approach to the Bwamba and Lake Albert plains, it diminishes abruptly, while on the eastern slopes it hardly ever occurs. Here, however, *Imperata cylindrica* P. Beauv. is very prevalent, although well up on the slopes it is mixed with many herbaceous plants. About the base of the slopes and on the levels approaching them it forms pure stands waist deep.

An Elephant Grass belt is again encountered in the Kibale district and running into Mwengi, along a line roughly parallel with the mountain range.

Typical savannah is encountered from Hima at the southern end of the Ruwenzori range, especially in the neighbourhood of Lake Katwe where a great plain exists, made up of a mixture of *Themeda triandra* Forsk., *Hyparrhenia filipendula* Stapf, *Heteropogon contortus* P. Beauv., etc., which appears like a vast wheat field when the grasses are ripe. This is an area with a rainfall of about 30-35 inches,

whereas the Elephant Grass is not found much outside areas with a rainfall under 50 inches.

Elephant Grass is found only very sparingly in the northern parts of Busoga and the Eastern Province, which together make up the principal Cotton-growing areas of Uganda, but *Pennisetum polystachyon* Schult. becomes very prevalent. It is also a common grass on the Buvuma Islands adjoining Busoga, but being an annual, it does not in any way take the place of the Elephant Grass. *Imperata cylindrica* P. Beauv., *Setaria aurea* Hochst., *Hyparrhenia rufa* Stapf, and *H. filipendula* Stapf, together usually make up the grass areas in this part of Uganda. This combination holds good as a rule outside the Elephant Grass tracts. These are the main features of the grass lands of Uganda.

There are numerous grasses which although not forming a prominent part of the flora are excellent for fodder, and would be suitable for planting and sowing, either for grazing or for feeding to stock.

Up to the present very little has been attempted in the direction of ascertaining the economic value of the grasses, apart from a few readily available which have been tested in small plots with encouraging results. Tall grasses such as *Hyparrhenia rufa* Stapf, *H. cymbaria* Stapf, which flower readily and are coarse under natural conditions, were kept in a fine leafy condition throughout the year by a few periodical cuttings. Some of the tufted species were found difficult to keep free of weeds, whilst others of a close spreading habit, such as *Axonopus compressus* P. Beauv., *Cynodon plectostachyus* Pilger, and *Paspalum auriculatum* Presl. provided a fine cover and showed promise of standing pure for a long time.

T. D. M.

Enumeration of Uganda Species.

Urelytrum digitatum *K. Schum.* in Engl. Pflanz. Ost-Afr. C. 97 (1895) ; Stapf in Prain, Fl. Trop. Afr. ix. 48 (1917).
Masaka : Sango Bay, 1110 m., Oct. 1925, *M.* 746.

This is the second species of *Urelytrum* to be recorded from Uganda. It occurs sparingly distributed in open country on hillsides near lake level in the Sango Bay region, associated with *Hyparrhenia rufa* Stapf, *H. bracteata* Stapf, and *Andropogon canaliculatus* Schum. It is of little importance as a fodder.

Hemarthria fasciculata *Kunth,* Rév. Gram. i. 153 (1829) ; Stapf in Prain, Fl. Trop. Afr. ix. 55 (1917). *Rottboellia compressa* var. *fasciculata* Hack. in DC. Monogr. Phan. vi. 286 (1889). *R. fasciculata* Lam. Illustr. i. 204 (1791).
Sese Islands : Sozi, 1110 m., Dec. 1922, *M.* 377.

This grass is of fairly frequent occurrence in the Victoria Nyanza region, growing at the edge of the lake in open boggy parts, together with *Axonopus compressus* P. Beauv., *Mariscus* and *Kyllinga* spp. The ground is often flooded and this grass may prove useful for

planting in swampy areas. This is the first record of the species from Uganda.

Manisuris granularis *Sw.* Prodr. Veg. Ind. Occ. 25 (1788) ; Stapf in Prain, Fl. Trop. Afr. ix. 57 (1917). *Cenchrus granularis* L. Mant. ii. App. 575 (1771).
Budama : Paya, 1100-1200 m., July 1926, *M.* 1165.

An annual grass growing on sandy soil by the side of native paths and roads, on hills in the dry region. It is also found rather scattered in open pockets on the savannah where the sand has been washed, but is not prominent and is of little importance. Previously it had been collected at Umyoro, in Nov. 1862, by Speke and Grant.

Lasiurus Maitlandii *Stapf et Hubbard* in Kew Bull. 1927, 264.
Serere : Serere, 1140 m., July 1926, *M.* 1282.

A tufted grass of little importance, found growing in rather dry, stony, open country, subject to grass fires, together with *Hyparrhenia filipendula* Stapf, *Themeda triandra* Forsk., and *Imperata cylindrica* P. Beauv.

Elyonurus argenteus *Nees*, Fl. Afr. Austr. 95 (1841) ; Stapf in Prain, Fl. Trop. Afr. ix. 70 (1917).
Masaka : on plains a little beyond Kyotera, Oct. 1925, *M.* 769.

A tufted grass with little leaf development, growing under similar conditions to *Lasiurus Maitlandii* Stapf et Hubbard, in savannah country, with scattered specimens of *Acacia* and *Capparis* spp. It has not before been collected in Uganda.

Rottboellia exaltata *Linn. f.* Suppl. 114 (1781) ; Stapf in Prain, Fl. Trop. Afr. ix. 73 (1917).
Kampala : 870 m., Oct. 1922, *M.* 260. Serere : Tira, 1110 m., July 1926, *M.* 1436.

A very common grass, generally distributed in the open or under the shade of trees, though not in great quantity. It forms a pure stand in old cultivated ground and near habitations. In its vegetative state it is a useful fodder grass, but dies down rapidly. It was first collected in Uganda by Dummer (3095), at Mukono in Feb., 1917.

Coelorhachis afraurita *Stapf* in Bull. Soc. Bot. Fr. lv, Mèm. viii. 98 (1908) and in Prain, Fl. Trop. Afr. ix. 80 (1917).
Masaka : Bukakata, June 1925, *M.* 782.
Vern. Name : *Njegu.*

This gathering considerably extends the distribution of the species. Up to 1917 it had only been recorded from French Guinea and Angola, now it has been collected in the Tanganyika Territory, Kyimbila District (*Stolz* 1372), and in Rhodesia at Marandellas (*Eyles* 3444), Salisbury (*Eyles* 2168).

In Uganda it grows in alluvial sandy country (boggy in wet seasons) almost at lake-level. It is quite a good fodder-grass as it is of rather a leafy nature.

Imperata cylindrica *P. Beauv.* var. **Thunbergii** *Durand et Schinz*, Consp. Fl. Afr. v. 693 (1894) ; Stapf in Prain, Fl. Trop. Afr. ix. 88 (1917).
Vern. Name : *Lusenke.*

A grass very widely distributed throughout Uganda. It forms large, almost pure belts or is scattered about on hill slopes with good soil, but is not found to any extent in open savannahs or waterless tracts. It is often mixed with *Pennisetum purpureum* Schum. and many other grasses, trees, shrubs and herbs such as *Acacia stenocarpa* Hochst., *Clerodendron myricoides* R. Br., *Lantana camara* L., *L. trifolia* L., and species of *Securidaca, Anona, Vernonia, Wedelia, Coreopsis, Pentas,* etc. It is grazed by cattle and game, providing a good feed all the year round, as, owing to its deep roots, it suffers little during the dry season ; in cultivated ground, however, it is a troublesome weed. The natives use it for thatching their huts, the stems and leaves being very durable.

Saccharum spontaneum *L.* var. **aegyptiacum** *Hack.* in DC. Monogr. Phan. vi. 115 (1889) ; Stapf in Prain, Fl. Trop. Afr. ix. 95 (1917).
Entebbe : 1160 m., July 1922, *M.* 19.
Vern. Name : *Kisalo.*

A tall stout grass from 12 to 18 ft. high, with very beautiful, conspicuous, silvery panicles ; common on the swampy shores and in the water of the Victoria Nyanza, and on the banks of rivers. It occurs mixed with bushes, *Cyperus Papyrus* L., and in association with " Ambatch " (*Herminiera Elaphroxylon* G. et P.). It is unimportant as fodder, but might be useful if cut and fed to stock. Before the days of imported salt, the natives used to extract salt from the ashes of the burned leaves and stems. This gathering is the first from Uganda.

Sorghum aterrimum *Stapf* in Prain, Fl. Trop. Afr. ix. 121 (1917).
Busoga : Namwendwa, railway cutting, 1110 m., July 1926, *M.* 1405.

This appears to be a race distinct from the other two recorded by Stapf, l.c. The rhachis, branches and branchlets have very hairy joints and the spikelets have slightly longer awns ; otherwise it agrees well with the species. As regards its uses, it is comparable with *S. verticilliflorum* Stapf.

S. rigidifolium *Stapf* in Prain, Fl. Trop. Afr. ix. 143 (1917).
Masaka : Kyotera region, *M.* 747 ; Mbarara Road, Oct. 1925, *M.* 767.

Not very common in Uganda. It grows on the sides of roads in savannahs which become waterlogged during the rains. The vegetative characters are rather good and although tufted it may prove to be a useful grass for planting for fodder. It had previously been collected by Sir Evan James at Sibu in the Nandi country in 1905.

S. verticilliflorum *Stapf* in Prain, Fl. Trop. Afr. ix. 116 (1917).
Entebbe : 1160 m., Aug. 1922, *M.* 89. Ruwenzori : Kikorongo, 1080 m., Dec. 1925, *M.* 1400.
Vern. Name : *Oluwemba Olukatale* (Sorghum of the bush, or Wild Sorghum ; the native name of the cultivated Sorghum is *Oluwemba*).

A grass similar to *S. arundinaceum* Stapf, but more valuable. In its vegetative state it forms good fodder and is suitable for silage or for cutting and feeding to stock. It answers practically the same purpose as *S. sudanense* Stapf (Sudan Grass) and appears to be worthy of cultivation, but it is not of much use for hay. Like *Rottboellia exaltata* Linn. f., it grows in old cultivated ground, usually on heavy soils, where it forms pure stands. Previously Dummer (474) had collected it at Kipayo in Dec. 1913.

Cleistachne sorghoides *Benth.* in Hook. Ic. Pl. xiv. 60, t. 1379 (1882) ; Stapf in Prain, Fl. Trop. Afr. ix. 154 (1917).
Entebbe : 1160 m., Aug. 1922, *M.* 88.
Vern. Name : *Kikonsikonsi*. This name is applied to numerous grasses with panicled inflorescences, but particularly to *Panicum maximum* Jacq., and it implies that the cattle are able to " smell it out."

It grows in Elephant Grass country in stony ground on hillsides and is rather sparingly distributed. It occurs mainly where the *Pennisetum purpureum* (Elephant Grass) zone on the lower slopes merges into the *Imperata cylindrica* zone on the upper slopes ; here it is associated with species of *Tephrosia*, *Crotalaria* and *Vernonia*. The inflorescences are very beautiful ; in the young state they are of a pale chestnut-brown shade, but at maturity they change to a dark brown. Dummer (679) collected this grass at Kipayo in Feb. 1914.

Arthraxon Quartinianus *Nash* in North Amer. Fl. xvii. 99 (1912) ; Stapf in Prain, Fl. Trop. Afr. ix. 166 (1917).
Ruwenzori : Musandama, 1800 m., Dec. 1925, *M.* 1007.

Growing at the edge of forests and in forest paths. It is similar to *Oplismenus hirtellus* P. Beauv., in habit and is of little or no economic importance.

Amphilophis insculpta *Stapf* in Prain, Fl. Trop. Afr. ix. 176 (1917). *Andropogon insculptus* Hochst. ex A. Rich. Tent. Fl. Abyss. ii. 458 (1851).
Ruwenzori : Kikorongo, 1080 m., Dec. 1925, *M.* 1399.

A savannah grass, with the same uses as *Andropogon canaliculatus* Schum., *Hyparrhenia filipendula* Stapf and *H. Ruprechtii* Stapf. It had previously been collected in Uganda by Dummer (3177) at Bugungu on grassy uplands at 1200 m. in May 1917.

Andropogon canaliculatus *Schum.* var. **Fyffei** *Stapf* in Prain, Fl. Trop. Afr. ix. 252 (1918).
Entebbe : 1160 m., Aug. 1922, *M.* 77.
Vern. Name : *Mbubu* (small variety).

A well known grass in the Victoria Nyanza region, where it is associated with *Trichopteryx kagerensis* K. Schum., *Hyparrhenia filipendula* Stapf and *Imperata cylindrica* P. Beauv., on grassy and gravelly slopes and sandy levels. It is not a bulky grass but stands grazing well.

A. eucomus *Nees*, Fl. Afr. Austr. 104 (1841) ; Stapf in Prain, Fl. Trop. Afr. ix. 230 (1918).
Kampala : in bog near Ruboga, 1170 m., Oct. 1922, *M.* 675.

A slender grass occasionally seen in or about boggy land growing among *Imperata cylindrica* P. Beauv., *Pennisetum purpureum* Schum., and species of *Mariscus* and *Kyllinga*. Its downy heads are rather pretty and conspicuous, but the grass itself is of little importance, although grazed with other grasses by cattle.

A. shirensis *Hochst. ex A. Rich.* Tent. Fl. Abyss. ii. 456 (1851) ; Stapf in Prain, Fl. Trop. Afr. ix. 246 (1918).
Sese Islands : Bunyama Island, 1140 m., July 1925, *M.* 800.
Ruwenzori : Kibuku, Dec. 1925, *M.* 1453.

This grass grows in savannah under similar conditions to *A. canaliculatus* Schum. It has not previously been recorded from Uganda.

Cymbopogon afronardus *Stapf* in Prain, Fl. Trop. Afr. ix. 279 (1918).
Entebbe : 1160 m., June 1922, *M.* 25.
Vern. Name : *Tete.*

A tufted grass, common in Uganda, frequent on hillsides and around native huts, where it grows in association with *Hyparrhenia cymbaria* Stapf, *H. rufa* Stapf, *Imperata cylindrica* P. Beauv., *Pennisetum purpureum* Schum., and species of *Crotalaria*, *Tephrosia* and *Vernonia*. It is slightly aromatic, and is covered with a greyish-blue bloom. The natives use it as a floor-covering for their huts. It is grazed by stock, especially goats, and Grant (1042), who collected it at Njabini on the S.E. slopes of the Aberdares in Kenya Colony, states that it is readily eaten by cattle and that horses are fond of it. It has been tried for oil but is not comparable with *C. Nardus* Rendle.

C. excavatus *Stapf* in Prain, Fl. Trop. Afr. ix. 285 (1918).
Andropogon excavatus Hochst. in Flora, 1846, 116.
Serere : Serere, 1110 m., July 1926, *M.* 1428. Ruwenzori : Hima-Kikorongo area, 900 m., Dec. 1925, *M.* 1027.

A spreading aromatic grass, growing sparingly in typical savannah of the dry regions, together with *Themeda triandra* Forsk., and *Heteropogon contortus* P. Beauv. It differs from *C. afronardus* Stapf in not being tufted, neither has it the vegetative bulk of that species.

C. giganteus *Chiov.* Gram. da Essenze, 12 (1909) ; Stapf in Prain, Fl. Trop. Afr. ix. 288 (1918). *Andropogon giganteus* Hochst. in Flora, 1844, 242.

Budama : Tororo, 1110-1200 m., July 1926, *M.* 1179.

On the slopes of the Tororo rock this grass, together with *Hyparrhenia variabilis* Stapf, forms a dense zone of considerable size, with a few scattered specimens of *Acacia stenocarpa* Hochst., *Albizzia Zygia* Macbride, and *Grewia* spp. On the lower slopes of the rock the commoner grasses are *Hyparrhenia variabilis* Stapf, *H. rufa* Stapf, *Imperata cylindrica* P. Beauv., *Panicum maximum* Jacq., *Cymbopogon afronardus* Stapf, *Melinis tenuissima* Stapf, and *Chloris Gayana* Kunth. It is a spreading and slightly aromatic grass and similar in this respect to *C. excavatus* Stapf, but it is much stronger and larger, ranging from 4 to 8 feet high. This is the first gathering of the species in Uganda.

Hyparrhenia bracteata *Stapf* in Prain, Fl. Trop. Afr. ix. 360 (1918).
Andropogon bracteatus Humb. et Bonpl. ex Willd. Sp. Pl. iv. 914 (1806).
Masaka : on plains below Minziro Hill, Oct. 1925, *M.* 762.

A similar grass to *H. rufa* Stapf and growing under the same conditions. Dummer (3284) first collected it in Uganda near Mubango in the Mabira Forest Region.

H. cymbaria *Stapf* in Prain, Fl. Trop. Afr. ix. 332 (1918).
Andropogon cymbarius L. Mant. Alt. 303 (1771).
Kampala : Nakasero Hill, Nov. 1922, *M.* 161.
Vern. name : *Tusimbunkokola.*

A grass similar to *H. rufa* Stapf and growing under identical conditions. It is somewhat widely spread in Uganda and is usually found in patches. A pure dense stand, however, occurs over a large area at the base of the Nawembe rock in Busoga. The inflorescences are rather striking and decorative. It is a strong tufted grass if left ungrazed, but on cutting and preventing from flowering, it produces a good deal of leaf. These remarks apply also to *H. rufa* Stapf, *H. bracteata* Stapf and *H. diplandra* Stapf.

H. diplandra *Stapf* in Prain, Fl. Trop. Afr. ix. 368 (1918).
Andropogon diplandrus Hack. in Flora, 1885, 123.
Sese Islands : Bwema Island, April 1925, *M.* 898.

A grass occurring on the slopes of the islands under similar conditions to *H. rufa* Stapf, and to some extent it is comparable with it.

H. filipendula *Stapf* in Prain, Fl. Trop. Afr. ix. 322 (1918).
Andropogon filipendulus Hochst. in Flora, 1846, 115.
Entebbe : 1160 m., June 1922, *M.* 21. Budama : Tororo, 1110 m., July 1926, *M.* 1413. Serere : on Kyere rock, 1110 m., July 1926, *M.* 1412A. Masaka : Minziro Hill, Oct. 1925, *M.* 751.

A typical savannah grass frequent on sandy gravelly soils, where it is associated with *Themeda triandra* Forsk., *Andropogon canaliculatus* Schum., and in the lake region with *Trichopteryx kagerensis* K. Schum. It is a useful feed in the dry regions and under cultivation makes a good stand.

H. rufa *Stapf* in Prain, Fl. Trop. Afr. ix. 304 (1918). *Trachypogon rufus* Nees, Agrost. Bras. 345 (1829).
Entebbe : 1160 m., July 1922, *M.* 15. Busoga : Buyonjo, July 1926, *M.* 1445 ; Gadumire, in bush and grass country, July 1926, *M.* 1447. Mt. Elgon : Bupota, 1650 m., Dec. 1926, *Snowden* 1029. Serere : on Kyere rock, 1110 m., July 1926, *M.* 1412. Kumi : Kumi camp, in savannah, July 1926, *M.* 1446.
Vern. Names : *Njegala* ; *Namula* (Lugishu).

A common grass on the slopes of hills and in the savannah country of the Victoria Nyanza region. It is associated there with *Imperata cylindrica* P. Beauv., *Pennisetum purpureum* Schum., *Panicum maximum* Jacq., *Cymbopogon afronardus* Stapf, *Hyparrhenia cymbaria* Stapf, *Bracharia brizantha* Stapf and species of *Crotalaria, Vernonia, Tephrosia, Acacia, Albizzia, Bauhinia, Terminalia* and *Grewia*.

It grows in clumps and the stems are rather striking owing to the dark-green leaf-sheaths alternating with the bright straw colour of the stems. Although a coarse tufted grass it grazes well and then forms a good deal of leaf. *H. rufa* Stapf, *H. cymbaria* Stapf, and *H. variabilis* Stapf, are the most useful of the species of *Hyparrhenia* for planting up for silos or for feeding to stock. *H. filipendula* Stapf however, provides a great deal of fodder after the savannah has been burned over, when the young growth is readily eaten by cattle.

H. Ruprechtii *Fourn.* Mex. Pl. Gram. 67 (1881) ; Stapf in Prain, Fl. Trop. Afr. ix. 326 (1918).
Kampala : Kololo Hill, 1170 m., May 1923, *M.* 712.

This grass has the same properties as *H. filipendula* Stapf.

H. variabilis *Stapf* in Prain, Fl. Trop. Afr. ix. 334 (1918).
Budama : Tororo, 1110-1200 m., July 1926, *M.* 1179A.

A grass very similar to *H. cymbaria* Stapf, and, with *Cymbopogon giganteus* Chiov., covering a considerable area of Tororo rock. Previously this grass had only been recorded from Nyasaland and Rhodesia.

Heteropogon contortus *P. Beauv. ex Roem. et Schult.* Syst. Veg. ii. 836 (1817) ; Stapf in Prain, Fl. Trop. Afr. ix. 411 (1919). *Andropogon contortus* L. Sp. Pl. ed. i. 1045 (1753).
Kumi : Kumi Camp, 1170 m., July 1926, *M.* 1250. Serere : Serere, 1110 m., July 1926, *M.* 1431. Ruwenzori : Semliki Plains, 600 m., Dec. 1925, *M.* 955 ; Kikorongo, 1110 m., *M.* 955A.

A typical savannah grass, associated with *Themeda triandra* Forsk., and comparable with it to a certain extent as regards vegetative characters ; it is, however, only eaten when young on account of the awns.

Themeda triandra *Forsk.* Fl. Aegypt.-Arab. cxxiii. and 178 (1775) ; Stapf in Prain, Fl. Trop. Afr. ix. 416 (1919).
Busoga : Namatumba, 1110-1200 m., July 1926, *M.* 1116.

Budama : Tororo, 1140 m., July 1926, *M.* 1416. Masaka : Minziro Hill, Oct. 1925, *M.* 750.

A very prominent savannah grass and probably forming the major portion of the feeding. It occurs frequently on flat stretches and slopes in gravelly areas of the Lake region, usually associated with *Trichopteryx kagerensis* K. Schum.

Digitaria abyssinica *Stapf* in Kew Bull. 1907, 213 and in Prain, Fl. Trop. Afr. ix. 460 (1919).
Mt. Elgon : Bupota, 1650 m., Dec. 1926, *Snowden* 1022.
Vern Name : *Lumbugu.*

A grass widely spread in Uganda where it is a most obnoxious weed in gardens and plantations. Owing to its long creeping branched rhizomes it spreads rapidly over cleared ground, rendering cotton and other cultivated areas useless if care is not exercised. It forms however very good lawns and is a useful fodder grass, but its utility is restricted on account of its spreading habit. On the slopes of Mt. Elgon at Bupota, it forms short grass land at 1200-1800 m., where it is grazed by cattle. Brown and Hunter in " Planting in Uganda," pp. 78 and 79, figure it under the name of *D. mutica.*

D. horizontalis *Willd.* Enum. Hort. Berol. 92 (1809) ; Stapf in Prain, Fl. Trop. Afr. ix. 436 (1919).
Entebbe : 1160 m., June 1922, *M.* 24. Ruwenzori : Bwamba, growing around hot springs, 840 m., Dec. 1925, *M.* 957.
Vern. Name : *Kakuku.*

An annual grass, frequent on the sides of roads and paths, especially under sandy conditions, and as a weed in coffee plantations. It is not of much importance although it serves as a fodder for cows, goats, etc. Brown and Hunter, l.c. 79. figure it under the name of *D. fenestrata* and give the vernacular name as " Kuku."

D. longiflora *Pers.* Syn. i. 85 (1805) ; Stapf in Prain, Fl. Trop. Afr. ix. 469 (1919). *Paspalum longiflorum* Retz. Obs. iv. 15 (1786).
Budama : Paya, 1110-1200 m., July 1926, *M.* 1164.

A creeping grass on sandy soil. It does not provide much cover and is too superficial to be of use as a lawn grass.

D. Maitlandii *Stapf et Hubbard* in Kew Bull. 1927, 266.
Masaka : Mbarara Road, on roadside and on plains, Oct. 1925, *M.* 766. Ruwenzori : Bwamba, Bulanga, 840 m., Dec., 1925, *M.* 928.

A typical savannah grass and subject to burning. It stands drought well and has much the same uses as *Themeda triandra* Forsk.

D. marginata *Link*, var. **fimbriata** *Stapf* in Prain, Fl. Trop. Afr. ix. 440 (1919). *D. fimbriata* Link, Hort. Berol. i. 226 (1827).
Busoga : Gadumire, 1110 m., July 1926, *M.* 1417.

A spreading grass, rooting from the nodes, and with little vegetative bulk.

Digitaria uniglumis Stapf var. *major* Stapf, showing habit. A and B Spikelet, back- and front-view (×14). C Upper glume (×25). D Lemma of lower floret (×14). E Upper floret (×14).

D. ternata *Stapf* in Dyer, Fl. Cap. vii. 376 (1898) ; and in Prain, Fl. Trop. Afr. ix. 452 (1919). *Panicum ternatum* Hochst. in Flora, 1841, i. Intell. 19. and ex Steud. Syn. Pl. Glum i. 40 (1854) .
Kampala : 1140 m., Oct. 1926, *M.* 1386.

A common annual *Digitaria* with little vegetative development, occurring by the wayside in gravelly soil.

D. uniglumis *Stapf* in Prain, Fl. Trop. Afr. ix. 474 (1919). *Panicum uniglume* Hochst. in Flora, 1841, Intell. i. 19, and ex. A. Rich. Tent. Fl. Abyss. ii. 370 (1851).
Sese Islands : in grasslands on slopes of hills, June 1925, *M.* 1452.

D. uniglumis var. **major** *Stapf* in Prain, Fl. Trop. Afr. ix. 476 (1919).
Ruwenzori : Musandama, 1500-1800 m., Dec. 1925, *M.* 1384.
Masaka : Tero Forest region, 1110 m., Oct. 1925, *M.* 748.

A rather common grass, found adjoining forest regions and near boggy places. On the slopes of Mt. Musandama it grows in grassland near the edge of forests and is there associated with *Imperata cylindrica* P. Beauv., *Festuca* sp., *Coreopsis ruwenzoriensis* S. Moore, *Rubus*, *Pycnostachys*, *Wedelia*, *Ferula spp.*, etc. It may prove a suitable fodder grass for planting in boggy areas.

Alloteropsis angusta *Stapf* in Prain, Fl. Trop. Afr. ix. 485 (1919).
Masaka : Minziro Forest area, 1140 m., Oct. 1925, *M.* 749.

This grass has previously been recorded only from Angola.

Eriochloa acrotricha *Hack. ex Thell.* in Viertelj. Naturforsch. Ges. Zurich, lii. 435 (1907) ; Stapf in Prain, Fl. Trop. Afr. ix. 499 (1919). *Helopus acrotrichus* Steud. Syn. Pl. Glum. i. 100 (1854).
Kumi : Kumi camp, in savannah, 1080 m., July 1926, *M.* 1432.

Not frequent and previously unrecorded from Uganda.

E. ramosa *O. Kuntze*, Rev. Gen. Pl. ii. 775 (1891) ; Stapf in Prain, Fl. Trop. Afr. ix. 497 (1919). *Milium ramosum* Retz. Obs. vi. 22 (1791).
Ruwenzori : Bwamba, 840 m., Dec. 1925, *M.* 945.

Found growing on the edge of hot springs under salty conditions. It has hitherto not been recorded from Uganda.

Bracharia brizantha *Stapf* in Prain, Fl. Trop. Afr. ix. 531 (1919). *Panicum brizanthum* Hochst. in Flora, 1841, Intell. i. 19, and ex A. Rich. Tent. Fl. Abyss. ii. 363 (1851).
Entebbe : 1160 m., Aug. 1922, *M.* 83 ; Oct. 1922, *M.* 256. Busoga : Nawandala, 1110 m., July 1926, *M.* 1426. Mt. Elgon : Bupota, 1650 m., Dec. 1926, *Snowden* 1025. Ruwenzori : Hima, 960 m., Dec. 1925, *M.* 971 and 972.
Vern. Name : *Kifuta* ; also applied to *Melinis minutiflora* P. Beauv., and *M. Maitlandii* Stapf et Hubbard.

A grass frequent throughout Uganda, except in the savannah, and probably the best fodder grass. It withstands grazing better

than most others and is much relished by cattle. In the neighbourhood of villages where heavy grazing takes place, it is usually the only grass left and when, under these conditions, it is associated with *Pennisetum purpureum* Schum., and *Pancium maximum* Jacq., the latter grasses soon die out. Similarly on golf courses where subject to frequent cutting, it rapidly forms the major portion of the verdure.

On the slopes of Mt. Elgon at Bupota, it is associated with *Eragrostis tenuiflora* Hochst., *E. paniciformis* Steud., *Cynodon Dactylon* Pers., *Sporobolus indicus* R. Br., *Brachiaria brizantha* Stapf, *Digitaria abyssinica* Stapf, and *Hyparrhenia rufa* Stapf, forming grazing lands which are much frequented by stock (Snowden).

Both hairy and glabrous forms are found growing in the same community, often side by side, but not from the same tuft ; the glabrous form being a stiffer plant. These glabrous and hairy forms in Uganda grasses are found particularly in *Setaria aurea* Hochst., *Trichopteryx kagerensis* K. Schum., and *Hyparrhenia filipendula* Stapf.

A small plot of this grass planted at the experimental plantation at Kampala when in flower was frequently visited by bees ; it was the only grass among many species so visited.

B. comata *Stapf* in Prain, Fl. Trop. Afr. ix. 561 (1919). *Panicum comatum* Hochst. ex A. Rich. Tent. Fl. Abyss. ii. 376 (1851).
Busoga : Dumba Ferry, in gravel, 1110 m., July 1926, *M.* 1151.
Kumi : Kumi camp, 1110 m., July 1926, *M.* 1434.

A grass of some promise for fodder and with vegetative characters somewhat similar to those of *Bracharia brizantha* Stapf, but not so bulky.

B. decumbens *Stapf* in Prain, Fl. Trop. Afr. ix. 528 (1919).
Busoga : Buyonjo, 1140 m., July 1926, *M.* 1421.

Similar in vegetative characters to *B. brizantha* Stapf. The plants described in the Flora are rather weak examples, the specimens quoted above being up to $3\frac{1}{2}$ ft. high.

B. fulva *Stapf* in Prain, Fl. Trop. Afr. ix. 518 (1919).
Bulemezi : Luwelo, 1110 m., Oct. 1926, *M.* 1393. Budama : Tororo, 1140 m., July 1926, *M.* 1415.

In Uganda this grass is confined more to the drier regions, as for example the Eastern Provinces and Busoga. It is closely allied to *B. soluta* Stapf, and differs from that species in its much longer leaves, longer-ciliate rhachis and slightly larger spikelets. It is a more erect grass than *B. brizantha* Stapf, and does not have the same vegetative bulk ; nevertheless it is quite a good fodder grass. This is the first gathering of the species from Uganda.

B. Kotschyana *Stapf* in Prain, Fl. Trop. Afr. ix. 559 (1919). *Panicum Kotschyanum* Hochst. ex Steud. Syn. Pl. Glum. i. 68 (1854).

Sese Islands: around villages, July 1925, *M.* 892A. Entebbe: 1160 m., Oct. 1922, *M.* 253. Busoga: Buyonjo, 1140 m., July 1926, *M.* 1419. Serere: Serere, 1140 m., July 1926, *M.* 1284.

An annual grass, occurring in old cultivations and garden beds. It has little vegetative bulk compared with *B. brizantha* Stapf, but would probably prove useful as an annual hay grass.

B. leucacrantha *Stapf* in Prain, Fl. Trop. Afr. ix. 540 (1919). *Panicum leucacranthum* K. Schum. in Engl. Pflanz. Ost-Afr. C. 102 (1895).
Kumi: Kumi Camp, 1170 m., July 1926, *M.* 1247.

A short, softly-hairy savannah grass of little bulk. It would be suitable for growing in dry regions where *B. brizantha* Stapf may not stand. It is a new record for Uganda, having previously been collected from Kenya Colony and Tanganyika Territory.

B. semiundulata *Stapf* in Prain, Fl. Trop. Afr. ix. 556 (1919). *Panicum semiundulatum* Hochst. in Flora, 1841, i. Intell. Bl. 19; and ex A. Rich. Tent. Fl. Abyss. ii. 364 (1851).
Bugishu: Lukonge, 1500-1800 m., July 1926, *M.* 1410.

A low spreading annual grass, previously collected on the Ruwenzori by Stuhlmann.

B. soluta *Stapf* in Prain, Fl. Trop. Afr. ix. 519 (1919).
Entebbe: 1160 m., Dec. 1922, *M.* 584. Masaka: Katera, Tero Forest, Oct. 1925, *M.* 756; in savannah below Minziro Hill, Oct. 1925, *M.* 757.
Vern. Name: *Kifuta.*

This grass approaches *B. brizantha* Stapf in general utility, but has not the same vigour or vegetative bulk, neither is it so widely distributed.

Axonopus compressus *P. Beauv.* Agrost., 154 (1812); Stapf in Prain, Fl. Trop. Afr. ix. 566 (1919). *Milium compressum* Sw. Prodr. 24 (1788).
Sese Islands: Sozi, on lake shore, 1110 m., Dec. 1922, *M.* 378; Bukasa Island, 1110 m., July 1925, *M.* 774.

A lake-side grass, occurring almost to the water's edge, Owing to its close habit it is a useful lawn grass, somewhat similar to *Paspalum notatum* Fluegge. It is also suitable for paddocks, golf courses, for planting on banks to prevent soil erosion, and as a fodder for stock. It withstands dry conditions well and spreads fairly quickly, growing well under plantation conditions. In the lake region it is generally associated with *Panicum trichocladum* Hack., *Cyperus Papyrus* L., *Triumfetta tomentosa* Boj., and species of *Amomum* and *Mariscus.* This grass is commonly known as "Carpet Grass" in other parts of the world and is a useful pasture grass. It has not previously been recorded from E. Africa.

Paspalum auriculatum *Presl.* Rel. Haenk. 217 (1830); Stapf in Prain, Fl. Trop. Afr. ix. 572 (1919).

Sese Islands: Bukasa Island, 1140 m., *M.* 791. Bududa: July 1926, *M.* 1122A.

A strong vigorous species with broad luscious leaves, occurring in small pure patches about the edge of forests and under the shade of trees. It thrives well in the open under cultivation, forming a dense cover up to 2 ft. high and is suitable for grazing, but best for feeding to stock and for silos.

P. conjugatum *Berg.* in Act. Helv. vii. 129, t. 8 (1762); Stapf in Prain, Fl. Trop. Afr. ix. 569 (1919). *Digitaria conjugata* Schult. Mant. II. 262 (1824).
Bwamba: near Buyagu, Dec. 1926, *M.* 1392.

A grass with a close habit, occurring on the edges of roads and about Banana gardens in the low-lying region of Bwamba, between the Congo hills and the Ruwenzori range of mountains. It appears to be very suitable for sheep grazing and golf courses, being similar in habit to *Axonopus compressus* P. Beauv., but not so vigorous. This is the first record from Tropical East Africa, although the plant has been cultivated in Tanganyika Territory.

P. paniculatum *L.* Syst. ed. x. ii. 855 (1759); Stapf in Prain, Fl. Trop. Afr. ix. 577 (1920).
Bulemezi: Bukalasa, 1110 m., May 1926, *M.* 1385.

This plant was collected on the edge of a swamp in the nursery at the experimental plantation at Bukalasa, in or about a bed of *Paspalum notatum* Fluegge, which had been raised from seed received from Costa Rica. As it is a native of Tropical America, from Mexico and the West Indies southwards, it appears highly probable that it was introduced with the *P. notatum*, although it has been found apparently wild on the west coast of Africa.

P. scrobiculatum *L.* var. **Commersonii** *Stapf* in Prain, Fl. Trop. Afr. ix. 573 (1919). *P. Commersonii* Lam. Ill. i. 175, t. 43, f.1 (1791).
Sese Islands: Bukasa Island, 1140 m., June 1925, *M.* 791 A. Busoga: Nkumbi, 1110-1200 m., July 1926, *M.* 1122; Buyonjo, edge of lake, July 1926, *M.* 1442C. Serere: Serere, July 1926, *M.* 1442D.

A fairly widely distributed grass in the Victoria Nyanza region. Lawns originally planted up with *Cynodon Dactylon* Pers. become infested with it when they are beginning to wear out; the leaves have the habit of withering early and thus make the lawn unsightly. It is suitable for light grazing.

P. scrobiculatum *L.* var **polystachyum** *Stapf* in Prain, Fl. Trop. Afr. ix. 576 (1919).
Kampala: Mengo, edge of swamp, July 1926, *M.* 1442A. Bulemezi: Luwelo, swamp, July 1926, *M.* 1442. Bugishu: Lakonge, boggy place, July 1926, *M.* 1442B.

This variety occurs on the edges of swamps and is more luscious and vigorous.

Urochloa bifalcigera *Stapf* in Prain, Fl. Trop. Afr. ix. 588 (1920). *Panicum bifalcigerum* Stapf in Journ. Linn. Soc., Bot., xxxvii. 531 (1906).
Busoga : Kamuli, 1140 m., July 1926, *M.* 1441. Masaka : Minziro Hill, Oct. 1925, *M.* 752.

A softly-hairy tufted grass with a *Brachiaria*-like inflorescence. It is frequent on the elevated parts of Busoga above the villages, where it is associated with *Bauhinia Thonningii* Schum., *Anona senegalensis* Pers., species of *Grewia* and *Zizyphus*, *Carduus Schimperi* Sch. Bip., *Berkheya Spekeana* Oliver, *Asparagus africanus* Lam., etc., all typical of the drier regions outside the Victoria Nyanza belt. About Tororo, as elsewhere, it occurs with *Imperata cylindrica* P. Beauv., *Cymbopogon afronardus* Stapf, *Brachiaria brizantha* Stapf, *Themeda triandra* Forsk., and *Hyparrhenia filipendula* Stapf. It appears to be much liked by stock as clumps of it were picked out and grazed.

U. Helopus *Stapf* in Prain, Fl. Trop. Afr. ix. 595 (1920). *Panicum Helopus* Trin. in Spreng. Neue Entdeck. ii. 84 (1821).
Busoga : Gadumire, 1110-1200 m., July 1926, *M.* 1087. Budama : Busiu, 1110-1200 m., July 1926, *M.* 1203.

A grass somewhat similar to *Brachiaria brizantha* Stapf in habit and vegetative characters, but not so widely distributed or occurring under such a wide range of conditions. It appears to occur more in Busoga and the Eastern Provinces than elsewhere. Previous to these collections it had not been recorded from Uganda.

Echinochloa colona *Link*, Hort. Berol. ii. 209 (1833) ; Stapf in Prain, Fl. Trop. Afr. ix. 607 (1920). *Panicum colonum* L. Syst. Nat. ed. x. ii. 870 (1759).
Busoga : Buteleja, 1110 m., July 1926, *M.* 1409, Bulemezi : Luwelo, 1110 m., Sept. 1926, *M.* 1359.

Usually found in boggy situations and in rice plots. It has not much vegetative development and is of little value for fodder.

E. Crus-Pavonis *Schult.* Mant. ii. 269 (1824) ; Stapf in Prain, Fl. Trop. Afr. ix. 612 (1920). *Oplismenus Crus-Pavonis* H. B. et K. Nov. Gen. et Sp. i. 108 (1815).
Bugishu : Bulucheke, 1500-1800 m., July 1926, *M.* 1414. Masaka : Mbarara Road, boggy places, Oct. 1925, *M.* 764.

A strong vigorous grass, usually found on the edges of streams and in swamps. It should prove suitable for feeding to stock or for silos.

E. pyramidalis *Hitchc. et Chase* in Contr. U.S. Nat. Herb. xviii. 345 (1917) ; Stapf in Prain, Fl. Trop. Afr. ix. 615 (1920). *Panicum pyramidale* Lam. Ill. i. 171 (1791), excl. var. *B.* and in Encyc. iv. 735 (1796).
Ruwenzori : Hima, Dec. 1926, *M.* 1383.

A tall tufted grass amongst bushes about the edge of grassy plains. In some respects it is comparable with *Panicum maximum* Jacq.

Oplismenus hirtellus *P. Beauv.* Agrost. 54, 168 (1812) ; Stapf in Prain, Fl. Trop. Afr. ix. 631 (1920). *Panicum hirtellum* L. Syst. Nat. ed. x. ii. 870 (1759).
Entebbe : 1160 m., Aug. 1922, *M.* 80. Bugishu : Bulucheke, 1230 m., July 1926, *M.* 1211.

Frequently found under forest or semi-forest conditions, such as the edges of forest paths, where it forms a close cover. It is of little use for fodder.

Panicum adenophorum *K. Schum.* in Engl. Pflanzenw. Ost-Afr. C. 103 (1895) : Stapf in Prain, Fl. Trop. Afr. ix. 654 (1920).
Masaka : Minziro Forest, in old cultivated patches and clearings, Oct. 1925, *M.* 753.

P. deustum *Thunb.* Prodr. i. 19 (1794) ; Stapf. in Prain, Fl. Trop. Afr. ix. 651 (1920).
Bwamba : Hakitenge, in damp situations, Dec. 1925, *M.* 449.
Mbarara : Ruisi Falls, at edge of river, Oct. 1925, *M.* 768.
Vern. Name : *Nkonsikonsi* ; this name is usually applied to *Panicum maximum* Jacq.

A vigorous grass, found in patches on the banks of streams. In its young state, it is a luscious grass suitable for feeding to stock.

P. fulgens *Stapf* in Prain, Fl. Trop. Afr. ix. 668 (1920). *P. globulosum* Mez in Engl. Jahrb. lvii. 188 (1921).
Serere : Serere, July 1926, *M.* 1427.

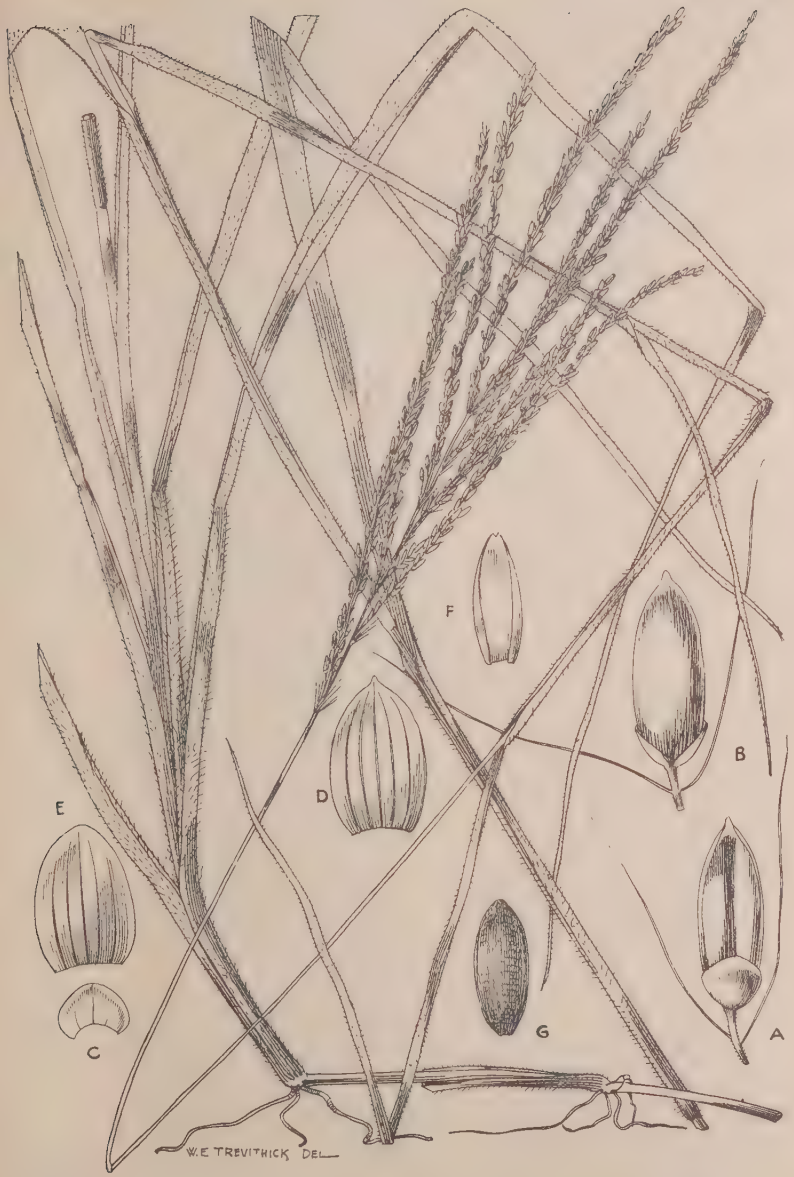
An annual grass about old cultivations ; it has the appearance of making good hay.

P. infestum *Peters*, Reise Mozamb. Bot. 546 (1863) ; Stapf in Prain, Fl. Trop. Afr. ix. 658 (1920).
Busoga : Busaba, 1110-1200 m., July 1926, *M.* 1136 ; near Namatumba, 1110 m., July 1926, *M.* 1418A.

This is the first record of this species from Uganda. It is a savannah grass and in general utility is comparable with such grasses as *Themeda triandra* Forsk., and *Andropogon canaliculatus* Schum.

P. maximum *Jacq.* Ic. i. 2, t. 13 (1781) ; Collect. i. 76 (1786) ; Stapf in Prain, Fl. Trop. Afr. ix. 655 (1920).
Entebbe : Nov. 1922, *M.* 289A. Sese Islands : Bukasa Island, 1140 m., June 1925, *M.* 795. Ruwenzori : Kirabawa, Dec. 1925, *M.* 1450.
Vern. Name : *Nkonsikonsi.*

A fairly widely distributed grass under varied conditions. It occurs to a greater or less extent all over Uganda, either scattered or forming large patches, as in the Victoria Nyanza region. There, it is associated with *Pennisetum purpureum* Schum., *Imperata cylindrica*



Panicum infestum Peters, showing habit. A and B Spikelet, front- and back-view (×9). C Lower glume (×8). D Upper glume (×7). E and F Lemma and palea of lower floret (×7). G Upper floret (×10).

P. Beauv., *Brachiaria brizantha* Stapf, *Hyparrhenia rufa* Stapf and *H. cymbaria* Stapf. It is one of the best of the larger grasses ; cattle relish it very much and it grazes well ; the natives say that their cattle can " smell it out and make for it." Under cultivation, especially with humid conditions, it thrives well and is readily propagated by division of the root-stock.

P. repens *L.* Sp. Pl. ed. ii. 87 (1762) ; Stapf in Prain, Fl. Trop. Afr. ix. 708 (1920).
Entebbe : Dec. 1922, *M.* 280. Ruwenzori : Katwe, 1080 m., Dec. 1925, *M.* 1388A.

Fairly frequent under moist and boggy conditions in the Lake region. It is a hard stiff grass and not too tempting to stock. Owing to its deep rooting powers and rapid spread, it might be useful for planting on banks as a protection against denudation.

P. trichocladum *Hack. ex Engl.* Hochgebirgsfl. Trop. Afr. 119 (1892) ; Stapf in Prain, Fl. Trop. Afr. ix. 659 (1920).
Entebbe : 1160 m., June 1922, *M.* 17 ; Oct. 1922, *M.* 252.
Vern. Name : *Kakonsikonsi* ; Nkonskonsi = *Panicum maximum* Jacq., and the prefix *Ka* means small.

A frequent grass about the lake shore, especially in old cultivations. It grows there in large pure patches, forming a close tangled cover and smothers for a time everything around it. The natives feed it to their goats. It often makes its appearance in plantations where it is a rather obnoxious weed.

Setaria aequalis *Stapf* in Kew Bull. 1927, 267.
Entebbe : 1160 m., Oct. 1922, *M.* 255.

A slender grass found under forest or semi-forest conditions. In *Acacia* regions bordering swamps, it is often found in large pure stands which are frequented by stock.

S. aurea *Hochst. ex A. Br.* in Flora, 1841, 276 ; Stapf in Dyer, Fl. Cap. vii. 426 (1899).
Sese Islands : Kome Island, in large masses on old cultivated ground, July 1925, *M.* 798. Entebbe : frequent in bushland and savannah, Nov. 1922, *M.* 289B. Bulemezi : Bukalasa, 1140 m., July 1926, *M.* 1352, 1353, 1354, 1355.

A tall tufted grass, which in the young state forms very good fodder. It is frequent throughout the Victoria Nyanza region and indeed throughout all Uganda, particularly on the hill-slopes, where it is associated with *Pennisetum purpureum* Schum., *P. unisetum* Benth., *Imperata cylindrica* P. Beauv., *Panicum maximum* Jacq., *Hyparrhenia cymbaria* Stapf, *H. rufa* Stapf, *Clerodendron myricoides* R. Br., *Lantana trifolia* L., *Carduus Schimperi* Sch. Bip., *Coreopsis ruwenzoriensis* S. Moore, *Acacia stenocarpa* Hochst., *Anona senegalensis* Pers., *Bauhinia Thonningii* Schum., etc.

Several forms are often found in one community. At Bulemezi, the following forms grow together ; a glaucous form (1353) ; a

hirsute glaucous form (1352) ; a glabrous non-glaucous form (1355) and a hirsute non-glaucous form (1354).

S. longiseta *P. Beauv.* Fl. Owar. ii. 81. t. 110, f. 2 (1807).
Masaka : on plains below Minziro Hill, Oct. 1925, *M.* 760. Busoga : Kamuli, 1110 m., July 1926, *M.* 1402 ; near Namatumba, 1110., July 1926, *M.* 1418. Budama : Tororo, 1140 m., July 1926, *M.* 1411.

This grass occurs on plains subject to water-logging during the rains. It is not widely spread in Uganda and has little promise as a fodder grass.

S. ramentacea *Stapf* in Kew Bull. 1927, 268.
Masaka : Mbarara Road, Oct. 1925, *M.* 765.

Also collected at Lugalambo in the Mabira Forest region by Dummer (3099). It is closely allied to *S. homonyma* Chiov., but differs in the smooth and glossy fertile florets, longer and narrower upper glume and slightly smaller spikelets.

S. rubiginosa *Miq.* Fl. Ind. Bat. iii. 467 (1859). *Panicum rubiginosum* Steud. Syn. Pl. Glum. i. 50 (1854). *Setaria imberbis* Stapf in Dyer, Fl. Cap. vii. 427 (1899) non Roem. et Schult.
Sese Islands : Komi Island, 1140 m., July 1925, *M.* 799. Busoga : Buteleja camp, 1110–1200 m., July 1926, *M.* 1097.

A short annual grass of little use, unless for making hay.

S. rubiginosa *Miq.* f. **penicillata** *Stapf. S. aurea* var. *penicillata* Stapf. in Cheval. Sudania, 146 (1911).
Busoga : Gadumire, 1110–1200 m., July 1926, *M.* 1086.
Vern. Name : *Mukiro mbwa* = dog's tail ; this grass is very aptly named by the natives, as the spikes are brown or buff-coloured and tail like.

A grass of lax habit, characterised by its looser inflorescences ; slender and often flexuous axis of the spikes ; longer, finer and mostly brightly coloured bristles. It has more vegetative bulk than the type and often occurs in large patches on old cultivations, making good cover up to 2 ft. high. As far as annual grasses are concerned, it is quite a good fodder, but although widely distributed, it is not a prominent grass in the vegetation.

S. sulcata *Raddi*, Agrost. Bras. 50 (1823) ; Stapf in Dyer, Fl. Cap. vii. 421 (1899). *Panicum sulcatum* Aubl. Pl. Guian. i. 50 (1775).
Entebbe : 1110 m., June 1922, *M.* 20.
Vern. Name : *Kisogalabusa.*

A stout broad-leaved grass growing under forest or semi-forest conditions. It is fairly frequent in the Lake region and is used as fodder by the natives.

S. verticillata *P. Beauv.* Agrost. 51, 178 (1812) ; Stapf in Dyer, Fl. Cap. vii. 429 (1899). *Panicum verticillatum* L. Sp. Pl. ed. ii. 82 (1762).

Entebbe : 1110 m., Oct. 1922, *M.* 251. Busoga : Kamuli, 1140 m., July 1926, *M.* 1403.
Vern. Name : *Bikwasi*=to take hold.

A grass frequent in old cultivations and as a weed about habitations in the Lake region. In its young state it forms a good fodder, but at maturity the barbed bristles of the spikes become a nuisance as they cling to stock.

Tricholaena rosea *Nees*, Cat. Sem. Hort. Vratisl. 1835 and in Linnaea, xi. Lit. Ber. 129 (1837) : Stapf in Dyer, Fl. Cap. vii. 443 (1899).
Busoga : Kamuli, 1140 m., July 1926, *M.* 1423.

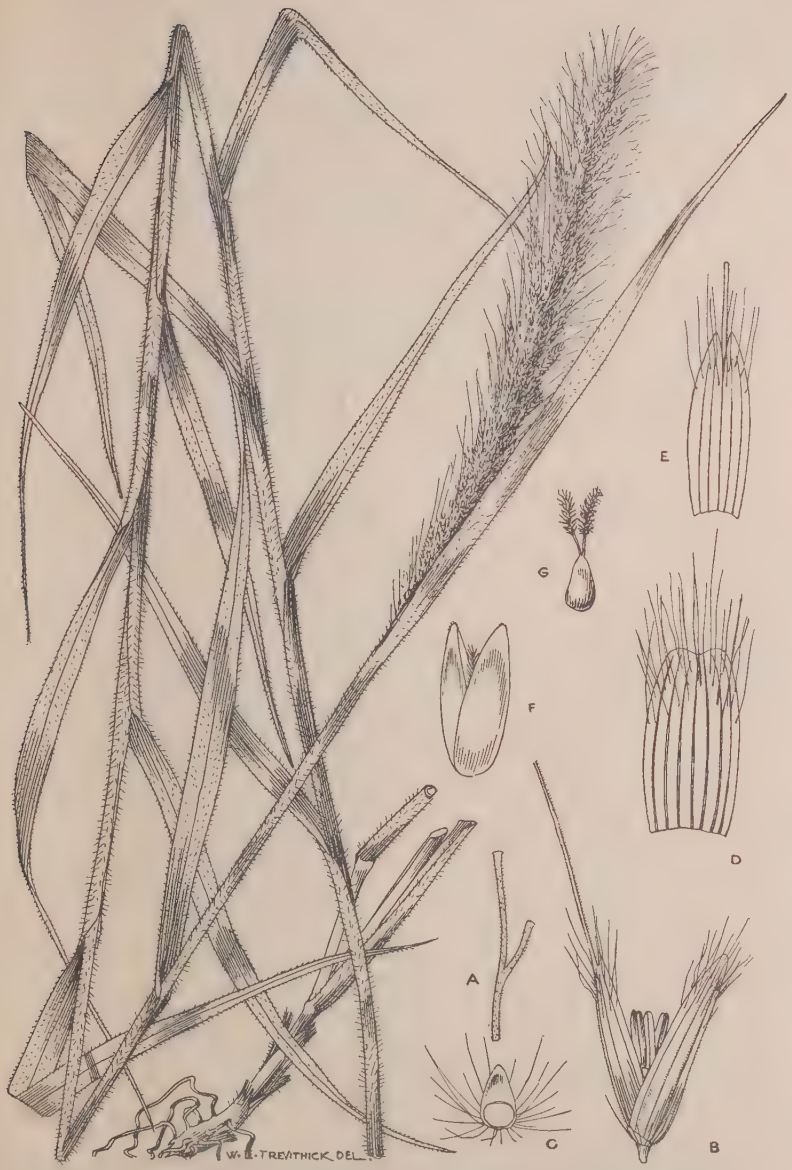
Common throughout Uganda, except in the mountainous regions. It often occurs in pure patches on old cotton and sweet-potato plots, etc., and on gravelly slopes. In the young condition it is a good fodder grass and at this stage the inflorescences are a rose or brownish-colour ; at maturity they whiten and give a very beautiful silvery effect when the sun strikes a large patch on the hillside.

Melinis Maitlandii *Stapf et Hubbard* in Kew Bull. 1926, 445.
Sese Islands : Bufumira Island, in open glade near forest, 1110 m., Dec. 1922, *M.* 360.
Vern. Name : *Kifuta*.

A grass very similar in its vegetative characters to *M. minutiflora* P. Beauv. It is not frequent in the Lake region and occurs more on the Sese Islands than on the mainland. It grows in small patches bordering forests on the hill slopes and is associated there with *Imperata cylindrica* P. Beauv. *Hyparrhenia filipendula* Stapf, *Trichopteryx kagerensis* K. Schum., *Lantana triflora* L., *Vernonia Smithiana* Less., *Wedelia oblonga* Hutch. It is a hirsute sticky grass giving off a peculiar linseed oil-like smell ; this odour is frequently encountered when passing from a forest glade into the savannah and from it the presence of the grass may be detected. Scott Elliot (1566) also collected it in the Ruwenzori region forests. A specimen collected by Maitland (755) at Katera in the Tero Forest, is probably *M. macrochaeta* Stapf et Hubbard, an annual species.

M. tenuissima *Stapf* in Hook. Ic. Pl. xxvii. t. 2660 (1900).
Budama : Tororo, 1110–1200 m., July 1926, *M.* 1178.

A spreading, wiry, perennial grass, usually in small patches on the hillsides amongst *Hyparrhenia filipendula* Stapf, *Coreopsis ruwenzoriensis* S. Moore, *Lantana trifolia* L., *L. camara* L., *Clerodendron myricoides* R. Br., and associated with such trees as *Acacia stenocarpa* Hochst., *Anona senegalensis* Pers., *Albizzia Zygia* Macbride, *Bauhinia Thonningii* Schum., etc. Under cultivation it has every promise of making good growth. In Tropical Africa it has a fairly wide distribution being found in Abyssinia, Kenya Colony to Rhodesia, Angola, Congo, Cameroons and Nigeria.



Melinis Maitlandii Stapf et Hubbard, showing habit. A Pedicels. B Spikelet (×15). C Lower glume (×20). D Upper glume (×13). E Lemma of lower floret (×13). F Upper floret (×17). G Pistil.

Pennisetum ciliare *Link*, Hort. Berol. i. 213 (1827). *Cenchrus ciliaris* L. Mant. 302 (1771). *Pennisetum cenchroides* L. Rich. in Pers. Syn. i. 72 (1805) ; Stapf in Dyer, Fl. Cap. vii. 433 (1899).
Ruwenzori : Kasese, 900 m., Dec. 1925, *M.* 997 ; Katwe, 1080 m., Dec. 1925, *M.* 1396.

A grass similar to *Setaria rubignosa* Miq., in general vegetative characters.

P. polystachyon *Schult.* in Roem. et Schult. Mant. ii. 146 (1824). *Panicum polystachyon* L. Syst. Nat. ed. x. ii. 870 (1759).
Busoga : Buyonjo, 1140 m., July 1926, *M.* 1420 ; Kamuli, M. 1420A.

An annual grass, especially frequent in the Busoga region, and to a lesser extent over the Eastern Province. In the former area it has frequently been observed forming pure stands on old cultivations and in cotton and sweet-potato patches. It occurs sparingly in the Victoria Nyanza region on a sandy stretch of savannah in the neighbourhood of Entebbe. It is a fine fodder grass, a quick grower, and is readily established from seed.

P. purpureum *Schum.* in Schum. et Thonn. Beskr. Guin. Pl. 44 (1827) ; Stapf in Kew Bull. 1912, 309.
Entebbe : 1160 m., Aug. 1922, *M.* 79.
Vern. Names : *Bisigazi* ; " Elephant Grass."

Elephant Grass is typical of Uganda, especially of the Victoria Nyanza region, where it covers large areas. It is found in the more fertile parts from the lake level to well up the gentle slopes round about. On the Congo side of the Ruwenzori mountains it forms a dense impenetrable cover up to 14 ft. high. Its distribution on the hill slopes frequently ends suddenly, to be followed by *Imperata cylindrica* P. Beauv., and other grasses. In the dry belt south of Toro to Lake Katwe and in the Eastern Province it does not occur, unless along streams or on the edges of swamps.

Native villages and plantations are invariably found in Elephant Grass areas, unless the people are pastoral. The canes or " Muli " are used for many purposes, but principally for the making of fences around native compounds and for lathwork of houses to support the mud plaster. The canes also provide paper-pulp material from which an excellent writing paper has been made experimentally. The young growths formed after burning are very luscious and much relished by stock and their feeding value is very high.

P. trachyphyllum *Pilger* in Engl. Jahrb. xxx. 122 (1901).
Ruwenzori : Toro ; Kasingo, growing along brooks and streams, 1500–1800 m., Dec. 1925, *M.* 1390.

A vigorous grass up to 4 ft. high and comparable with *Panicum deustum* Thunb., as regards utility. Specimens collected by Maitland (1422) at Buyobo in Busoga are probably a new species of *Pennisetum* closely allied to the above.

P. unisetum *Benth.* in Journ. Linn. Soc., Bot., xix. 47, 49 (1881). *Gymnothrix uniseta* Nees, Fl. Afr. Austr. 66 (1841).
Bulemezi: June 1925, *M.* 899.
Vern. Name: *Kituntugula.*

A tall, stiff, vigorous grass with tough leaves occurring in clumps on the edge of or in Elephant Grass land in the drier regions of Uganda. It is a good fodder grass and may be readily planted up from roots to form pure stands.

Isachne Buettneri *Hack. ex Buettn.* in Verh. Bot. Ver. Brand. xxxi. 69 (1889).
Victoria Nyanza region, *M.* 164.

T. elegans *Hack. ex Engl.* Hochgebirgsfl. Trop. Afr. 129 (1892). *Loudetia elegans* Hochst. in Flora, xxiv. (1841), i. Intell. 20 and ex Steud. Syn. Pl. Glum. i. 238 (1854).
Busoga: Namatumba, 1110–1200 m., July 1926, *M.* 1119.

A swamp grass with little leaf development.

T. kagerensis *K. Schum.* in Engl. Pflanzenw. Ost-Afr. C. 109 (1895).
Entebbe: 1160 m., June 1922, *M.* 22. Bulemezi: Luwelo, 1110 m., Sept. 1926, *M.* 1356.
Vern. Name: *Kalensiwe.*

One of the commonest grasses on the slopes near the Victoria Nyanza and on the Sese Islands. In these parts it forms the major portion of the grazing, being found over large areas almost as pure stands. Although typical of the Lake region it has been found under boggy conditions at Luwelo and on the hill tops near Mbarara. On good soil it forms a close cover, but on gravelly or poor soils it generally exists as a clump grass. After burning it provides a good feed which is much relished by stock. Propagation may be readily effected, either by seeds or by division of the roots.

Trichopteryx superba *Baglietto ex Chiov.* in Nuovo Giorn. Bot. Ital. xxvi. 79 (1919). *T. gigantea* Stapf in Kew Bull. 1897, 295. *Loudetia superba* De Not. in Ann. Sci. Nat. Ser. III. xix. 369 (1853).
Bugishu: Busiu, 1110–1200 m., July 1926, *M.* 1204 and 1204A.
Serere: Serere, stony ground, July 1926, *M.* 1204B.

This very beautiful grass has hitherto not been recorded from Uganda. It is a tall grass, occurring in scattered clumps and covered with a bluish bloom; this, together with its large panicles of brown spikelets, gives it a very striking appearance. It is sparingly distributed, has little leaf development and is therefore of little value as fodder.

Phragmites vulgaris *Crép.* Man. Fl. Belg. 345 (1866). *P. communis* Trin. Fund. Agrost. 134 (1820); Stapf in Dyer, Fl. Cap. vii. 541 (1899). *Arundo Phragmites* L. Sp. Pl. ed. i. 81 (1753). *Arundo vulgaris* Lam. Fl. Franç. iii. 615 (1778).

Trichopteryx superba Baglietto, showing habit. A Spikelet (×1½). B Lower glume (×1½). C Upper glume (×1½). D and E Lemma and palea of lower floret (×1½). F Upper floret (×1½). G Lemma (×1½). H Palea (×1½). I Lodicules and Stamens (×3). J Pistil (×3).

Lake Region : Nov. 1922, *M.* 290.
Vern. Name : *Biwuwa.*

A fairly frequent grass in swampy parts and on the lake shore. In regard to habit and utility it is similar to *Saccharum spontaneum* L.

Aristida adscensionis *L.* Sp. Pl. ed. i. 82 (1753) ; Stapf in Dyer, Fl. Cap. vii. 554 (1899).
Busoga : Gadumire, 1110–1200 m., July 1926, *M.* 1085. Ruwenzori : Hima, savannah, 900 m., Dec. 1925, *M.* 1043.

A typical grass of the dry savannah and usually associated with *Themeda triandra* Forsk., and *Heteropogon contortus* P. Beauv., but not so widely distributed.

Tragus racemosus *All.* Fl. Pedem. ii. 241 (1785) ; Stapf in Dyer, Fl. Cap. vii. 577 (1900). *Cenchrus racemosus* L. Sp. Pl. ed. i. 1049 (1753).
Ruwenzori : between Kirabawah and Hima, 900–1050 m., Dec. 1925, *M.* 976.

A short annual grass, found occasionally on paths and roads through the savannah and in patches on sandy soil. It is of little utility.

Perotis indica *O. Kuntze* Rev. Gen. Pl. 787 (1891). *Anthoxanthum indicum* L. Sp. Pl. ed. i. 28 (1753). *Perotis latifolia* Ait. Hort. Kew. i. 85 (1789) ; Stapf in Dyer, Fl. Cap. vii. 575 (1899).
Busoga : Budumba, July 1926, *M.* 1437A. Ruwenzori : Wasa, 1350 m., Dec. 1925, *M.* 1437. Masaka : Sango Bay, Oct. 1925, *M.* 754.

A small handsome and graceful grass found along paths and roads and in grass-lands. It is of little use for fodder.

Agrostis lachnantha *Nees* in Ind. Sem. Hort. Vratisl, 1834, and in Linnaea, x. Litt.-Bericht. 115 (1836) ; Stapf in Dyer, Fl. Cap. vii. 549 (1899).
Ruwenzori : Toro, 1500–1800 m., Dec. 1925, *M.* 1389.

A narrow-leaved grass with little vegetative development, occurring on damp clayey soil near hillsides from the Kasingo camp to Bwamba pass.

Sporobolus festivus *Hochst. ex A. Rich.* Tent. Fl. Abyss. ii. 398 (1851) var. **fibrosus** *Stapf* in Cheval. Sudan. 142, 155 (1911).
Ruwenzori : Kikorongo, 1080 m., Dec. 1925, *M.* 1395.

A graceful grass, but of little use ; growing on sandy or shallow soils overlying rocks.

S. Stapfianus *Gandoger* in Bull. Soc. Bot. Fr. lxvi. 302 (1920). *S. stuppeus* Stent in Bothalia, ii. 264 (1927). *S. festivus* Hochst. var. *stuppeus* Stapf in Dyer, Fl. Cap. vii. 582 (1900).
Entebbe : 1050 m., Dec. 1922, *M.* 460.

A small, tufted, perennial grass, growing under the same conditions as *S. pyramidalis* P. Beauv., but in no way comparable with that species as regards vegetative development.

S. indicus *R. Br.* 170 (1810) ; Stapf. in Dyer, Fl. Cap. vii. 586 (1900). *Agrostis indica* L. Sp. Pl. ed. i. 63 (1753).
Mt. Elgon : Bupota, 1650 m., Dec. 1926, *Snowden* 1026.
Vern. Name : *Lisusu* (Lugishu).

A tufted perennial, common on short grassland, used for grazing cattle, etc. It is eaten by stock when young, but later when old, the tufts are left and rise above the level of the surrounding turf.

S. Molleri *Hack.* in Bolet. Soc. Brot. v. 213 (1887).
Entebbe : 1160 m., Aug. 1922, *M.* 82.

An annual grass, frequently found at low levels in old cultivations, especially near swampy ground. It is of little importance as forage.

S. piliferus *Kunth,* Enum. Pl. i. 211 (1833). *Vilfa pilifera* Trin. Gram. Unifl. 157 (1824).
Sese Islands : Bubembe Island, on lake shore, 1110 m., Dec. 1922, *M.* 401.

A grass similar to *S. Molleri* Hack., and frequently found under boggy conditions.

S. pyramidalis *P. Beauv.* Fl. Owar. ii. 36 (1807).
Entebbe : 1160 m., Aug. 1922, *M.* 81. Busoga : Namatumba, July 1926, *M.* 1443A ; Dumba Ferry, in gravel in railway cutting, July 1926, *M.* 1443C. Bugishu : Busiu, July 1926, *M.* 1443. Budama : Tororo, on slopes of rock, July 1926, *M.* 1443B.

A tough, tufted grass, growing in clumps on the lake shore, especially in gravelly areas and also on hill slopes. It is frequent in the Entebbe region and on the Sese Islands and is a useful fodder, being readily eaten by stock.

S. robustus *Kunth,* Rév. Gram. ii. 425, t. 126 (1829).
Ruwenzori : Bwamba, towards Bulanga, 840 m., Dec. 1925, *M.* 997A ; Katwe, 1080 m., Dec. 1925, *M.* 1388.

A tufted grass resembling *S. pyramidalis* P. Beauv., but usually much larger. It is associated with *Pennisetum purpureum* Schum., on the edge of the Bwamba plains.

S. spicatus *Kunth,* Rév. Gram. i. 67 (1829) ; Hook. f. Fl. Brit. Ind. vii. 250 (1896). *Agrostis spicata* Vahl. Symb. i. 9 (1890).
Kumi : Kumi camp, savannah, July 1926, *M.* 1433. Ruwenzori : Katwe, Dec. 1925, *M.* 1381.

A short grass of little utility.

Harpachne Schimperi *Hochst.* in Flora, xxiv (1841), i. Intell. 20 and ex A. Rich. Tent. Fl. Abyss. ii. 431 (1851). *Eragrostis Schimperi* Benth. in Hook. Ic. Pl. xiv. 53, t. 1371 (1881).
Entebbe : 1160 m., Aug. 1922, *M.* 86A.

A short perennial grass of little importance, found on gravelly roadsides and on grassy slopes. It sometimes grows with *Eragrostis patens* Oliver.

Pogonarthria squarrosa *Pilger* in Notizbl. Bot. Gart. Berl. v. 149 (1910). *P. falcata* Rendle in Cat. Afr. Pl. Welw. ii. 232 (1899); Stapf in Dyer, Fl. Cap. vii. 589 (1900). *Leptochloa falcata* Hack. in Bull. Herb. Boiss. iii. 386 (1895). *Poa squarrosa* Licht. ex Roem. et Schult. Syst. ii. 553 (1817).
Busoga: Busaba, 1110–1200 m., July 1926, *M.* 1145.

An uncommon, tufted, perennial grass, found in the savannah adjoining bush. In its young state it would be suitable for fodder, but when old the flowering stems become very prominent.

Eragrostis aspera *Nees*, Fl. Afr. Austr. 408 (1841); Stapf in Dyer, Fl. Cap. vii. 628 (1900). *Poa aspera* Jacq. Hort. Vindob. iii. 32, t. 56 (1776).
Kampala: 1170 m., May 1923, *M.* 711. Busoga: Kamuli, 1110 m., July 1926, *M.* 1404.

An annual grass fairly frequent in the lake region, usually occurring as a weed in cotton patches, old cultivations, roadsides, etc. The large spreading panicles are very handsome, but the grass does not possess much value as fodder.

E. chalcantha *Trin.* in Mém. Acad. Pétersb., Sér. vi. i. 401 (1831); Stapf in Dyer, Fl. Cap. vii. 615 (1900). *Poa chalcantha* Kunth, Enum. Pl. i. 339 (1833).
Masaka: Kyotera, Oct. 1925, *M.* 871; between Masaka and Mbarara, on plain, Oct. 1925, *M.* 763.

A tufted perennial grass growing in typical savannah and subject to grass fires. It has not much vegetative development and its utility is thereby restricted.

E. ciliaris *Link*, Hort. Berol. i. 192 (1827); Stapf in Dyer, Fl. Cap. vii. 629 (1900). *Poa ciliaris* L. Amoen. Acad. v. 392 (1759).
Masaka: on plain below Minziro Hill, Oct. 1925, *M.* 759. Busoga: Nkumbi, 1110–1200 m., July 1926, *M.* 1123; Dumba Ferry, July 1926, *M.* 1123A.

A grass frequent in the Busoga District and Eastern Province. It usually occurs in patches or as individual tufts in unmown lawns, old cultivations and roadsides. It is not a leafy grass and appears to be of much the same use as *E. pilosa* P. Beauv., and *E. major* Host.

E. hispida *K. Schum.* in Engl. Pflanzenw. Ost-Afr. C. 114 (1895).
Entebbe region: 1160 m., Nov. 1922, *M.* 453. Budama: Tororo, 1110–1200 m., July 1926, *M.* 1175.

A short, tufted, perennial grass with hairy spikelets, growing in shallow soil on grassy tablelands. It is subject to drying off during the summer months.

E. major *Host*, Gram. Austr. iv. 14, t. 24 (1809); Stapf in Dyer, Fl. Cap. vii. 620 (1900). *Briza Eragrostis* L. Sp. Pl. ed. i. 70 (1753).

A frequent annual grass along paths and roads, often occurring in small pure patches. It is eaten by stock, but is not such a sweet grass, neither does it make such good hay, as *E. tef* Trotter (*E. abyssinica* Link).

E. patens *Oliver* in Trans. Linn. Soc. xxix. 175 (1875).
Entebbe : 1160 m., Aug. 1922, *M.* 86. Entebbe region : Kabale, 1150 m., Nov. 1922, *M.* 540.

A short grass, frequent on roadsides and gravelly patches ; it is of little importance for fodder.

E. pilosa *P. Beauv.* Agrost. 71, 162 (1812) ; Stapf in Hook. f. Fl. Brit. Ind. vii. 323 (1896). *Poa pilosa* L. Sp. Pl. ed. i. 68 (1753).
Kampala : 1140 m., May 1926, *M.* 1064. Busoga : Dumba Ferry, 1110 m., July 1926, *M.* 1408.

A grass similar in many respects to *E. tef* Trotter and might serve much the same purpose. It is frequently found on paths and old cultivations, and, although not a prominent grass in the vegetation, it is widely distributed.

E. plumosa *Link*, Enum. Hort. Berol. i. 192 (1827). *E. tenella* var. *plumosa* Stapf in Hook. f. Fl. Brit. Ind. vii. 315 (1896). *Poa plumosa* Retz. Obs. iv. 20 (1786).
Busoga : Namwendwa, 1110 m., July 1926, *M.* 1424.

A small, spreading, annual grass, growing on sandy paths in camp compounds. It is of little or no importance for forage purposes.

E. superba *Wawr. et Peyr.* in Sitz. Ber. Acad. Wien, Math.-Nat. Cl. xxxviii. 584 (1860) ; Stapf in Dyer, Fl. Cap. vii. 622 (1900).
Kumi : Kumi Camp, 1170 m., June 1926, *M.* 1249.

A tall, tufted, perennial grass with large flat spikelets, frequent in the savannah country of Kumi. It grows with *Themeda triandra* Forsk., and would come in the same category as that grass as regards its uses in Uganda.

E. paniciformis *Steud.* Syn. Pl. Glum. i. 268 (1854). *Poa paniciformis* A. Br. in Flora, xxiv. 274 (1841).
Mt. Elgon : Bupota, 1650 m., Dec. 1926, *Snowden* 1027. Ruwenzori : Katwe, 900 m., Dec. 1925, *M.* 975.

A grass of about the same use as *E. major* Host. On the slopes of Mt. Elgon it is a constituent of short grassland used for grazing and is eaten by cattle.

E. tef *Trotter* in Bull. Soc. Bot. Ital. 1918, 62. *Poa tef* Zucc. Dissert. L'Estor. di una pianta panizab. Firenze, 1775. *P. abyssinica* Jacq. Misc. ii. 364 (1781). *Eragrostis abyssinica* Link, Hort. Berol. i. 192 (1827).
Kampala : Dec. 1925, *M.* 1065.

An introduced grass, which has been planted up in small plots at Kampala for trail purposes. It is light and suitable for making hay, but in Uganda suffers from the heavy rains. It grows fast and soon ripens, and while it lasts, makes a good cover.

E. tenuifolia *Hochst.* in Flora, xxiv, i. Intell. 20 (1841) and ex A. Rich. Tent. Fl. Abyss i. 425 (1851) ; Stapf in Hook. f. Fl. Brit. Ind. vii. 322 (1896).
Mt. Elgon : Bupota, 1650 m., Dec. 1926, *Snowden* 1024.
Vern. Name : *Lufafa lusaja* (Lugishu).

A common grass forming short grassland which is used for grazing cattle and is much relished by them (Snowden).

E. tremula *Hochst. ex Steud.* Syn. Pl. Glum. i. 269 (1854) ; Stapf in Hook. f. Fl. Brit. Ind. vii. 320 (1896). *Poa tremula* Lam. Illustr. i. 185 (1791).
Ruwenzori : Katwe region, cultivated ground, 1050 m., Dec. 1926, *M.* 1438.

An annual grass with large handsome panicles. It is of little use as a fodder grass.

E. turgida *Pilger ex Jedwabnick* in Bot. Archiv. v. 182 (1924). *E. rubiginosa* Trin. in Mém. Acad. Pétersb., Sér. VI. i. 401 (1831). *Poa turgida* Schum. et Thonn. Beskr. Guin. Pl. 66 (1827).
Serere : Ngora, Oct. 1926, *M.* 1382.

A short annual grass with little bulk, occurring in stony places under semi-arid conditions.

Diplache Dummeri *Stapf et Hubbard* in Kew Bull. 1927, 270.
Bulemezi : Luwelo, 1110 m., Sept. 1926, *M.* 1361.

A swamp grass, associated with *Mariscus* sp., and other semi-aquatic plants. It does not appear to be of much value for fodder.

Leptochloa obtusiflora *Hochst.* in Flora, xxxviii. 203 (1855.)
Busoga : Buyonjo, at lake side, 1110 m., July 1926, *M.* 1100. Serere : Lobori, 1050 m., July 1926, *M.* 1345. Ruwenzori : Lake Katwe region, 900 m., Dec. 1925, *M.* 963.

A coarse grass with little leaf development, found in boggy soil.

Microchloa indica *P. Beauv.* Agrost. Expl. pl. xx. 13, t. 20, f. 8 (1812). *M. setacea* R. Br. Prodr. 208 (1810) ; Stapf in Dyer, Fl. Cap. vii. 636 (1900). *Nardus indica* L. f. Suppl. 105 (1781).
Masaka : Tero Forest region, on plains, Oct. 1925, *M.* 761.

A savannah grass of the Lake region and subject to grass fires. It is hardly of any importance for fodder.

Cynodon Dactylon *Pers.* Syn. i. 85 (1805) ; Stapf in Dyer, Fl. Cap. vii. 634 (1900). *Panicum Dactylon* L. Sp. Pl. ed. i. 58 (1753).
Vern. Name : *Lufafa Lukazi* (Lugishu).
Bugishu : Bufumbo, 1500 m., July 1926, *M.* 1435. Mt. Elgon : Bupota, 1650 m., Dec. 1926, *Snowden* 1023. Ruwenzori : Katwe 1080 m., Dec. 1925, *M.* 1387.

A creeping grass, frequently found along roadsides and known in Uganda as " French " or " Bahama " grass. It is used a great deal for lawns as it can be mowed closely, but unless the soil is rich it soon dies out. It is usually low, but in rich damp soil it may be as

much as 1½ ft. high. It is also suitable for planting up paddocks and for light grazing. Propagation may be effected by means of runners.

Cynodon plectostachyus *Pilger* in Engl. Jahrb. xl. 82 (1907).
Leptochloa plectostachya K. Schum. in Engl. Pflanzenw. Ost-Afr. C. 112 (1895).
Entebbe : 1160 m., June 1922, *M.* 23.
Vern. Name : *Kalandalengo*, from Landa=to wander.

A frequent grass in the Victoria Nyanza region and especially abundant around refuse pits and cattle kraals. It is a more vigorous grass than *Cynodon Dactylon* Pers., although resembling that species. It spreads rapidly, provides an abundance of fodder and stands grazing well.

Enteropogon melicoides *Nees* in Lindl. Introd. Nat. Syst. ed. ii. 449 (1836) ; Hook. f. Fl. Brit. Ind. vii. 284 (1896). *Ischaemum melicoides* Koen. ex Rottl. in Ges. Naturf. Neue Fr. Schrift. iv. 211 (1803) and ex Willd. Sp. Pl. iv. 941 (1806).
Ruwenzori : Kikorongo, savannah, 1110 m., Dec. 1925, *M.* 1397.

Chloris breviseta *Benth.* in Hook. Niger Fl. 566 (1849).
Busoga : Dumba Ferry, in gravelly soil, July 1926, *M.* 1444.

C. Gayana *Kunth*, Rév. Gram. i. 89, ii. 293, t. 58 (1829) ; Stapf in Dyer, Fl. Cap. vii. 642 (1900).
Busoga : Kamuli, *M.* 1394A. Bugishu : Busiu, 1110–1200 m., July 1926, *M.* 1198. Bulemezi : Luwelo, 1110 m., Oct. 1926, *M.* 1394.

A fairly frequent grass in the drier parts of Uganda. It is usually found at low levels and associated with *Hyparrhenia filipendula* Stapf, *Andropogon canaliculatus* Schum., *Cymbopogon afronardus* Stapf, *Panicum maximum* Jacq., and *Imperata cylindrica* P. Beauv., and amongst or in the shade of such trees as *Anona senegalensis* Pers., *Bauhinia Thonningii* Schum., *Acacia* and *Grewia spp.*

C. myriostachya *Hochst.* in Flora, xxxviii, 203 (1855).
Ruwenzori : Kikorongo, 1080 m., Dec. 1925, *M.* 1398.

An annual savannah grass. At Kikorongo it is associated with *Themeda triandra* Forsk., *Heteropogon contortus* P. Beauv., *Cymbopogon excavatus* Stapf, etc. It has a fairly good leafy base and shows some promise as a fodder grass.

C. virgata *Sw.* Fl. Ind. Occ. i. 203 (1797) var. **elegans** *Stapf* in Dyer, Fl. Cap. vii. 642 (1900). *C. elegans* H.B. et K. Nov. Gen. et Spec. i. 166, t. 49 (1815).
Ruwenzori: Kikorongo, 1080 m., Dec. 1925, *M.* 1398A.

C. pycnothrix *Trin.* Gram. Unifl. 234 (1824) ; Stapf in Dyer, Fl. Cap. vii. 641 (1900).

Entebbe : 1160 m., Aug. 1922, *M.* 84. Busoga : Namwendwa, 1110 m., July 1926, *M.* 1406.
Vern. Name : *Kasibante* ; applied to species of *Chloris* generally.

A frequent annual or perennial grass on paths and roadsides and often in large patches on gravelly soils. It does not possess much value as a pasture grass, but nevertheless it produces a fair amount of leaf. It roots from the nodes and on good soil might prove a useful hay grass and a good fodder during its young stages.

Ctenium elegans *Kunth*, Rév. Gram. i. 93 (1829).
Sese Islands : Bunyama Island, in savannah, 1110 m., *M.* 366.

A fairly frequent grass on the slopes of the Sese Islands. It is associated there with *Trichopteryx kagerensis* K. Schum., *Hyparrhenia filipendula* Stapf, and *Themeda triandra* Forsk., and is of nearly the same use as the latter.

Eleusine coracana *Gaertn.* Fruct. i. 8, t. 1, f. 11 (1788) ; Stapf in Dyer, Fl. Cap. vii. 645 (1900).
Victoria Nyanza region, *M.* 99.

There are numerous varieties and forms of this grass well known to the Uganda natives, especially the Nilotic and allied tribes, and used extensively by them as grain plants. The whole series is worthy of trial in order to ascertain their respective values. The grain is mostly used in the manufacture of beer. The grass is very subject to attacks by a species of *Striga* and in fact some of the native plots in the Ruwenzori region and in the Eastern Province were covered with it, but strange to say, there was little damage done to the crop. The *Striga* flowers just after the grain has been reaped and some of the plots were a mass of its beautiful pale mauve flowers.

E. indica *Gaertn.* Fruct. i. 8 (1788) ; Stapf in Dyer, Fl. Cap. vii. 645 (1900). *Cynosurus indicus* L. Sp. Pl. ed. i. 72 (1753).
Entebbe : 1160 m., Oct. 1922, *M.* 258.

A grass frequent on the hillsides, old cultivations, about rubbish heaps and on low-lying acid soils. It is not an important fodder grass in Uganda.

Dactyloctenium aegyptium *Richt.* Pl. Eur. i. 68 (1890). *D. aegyptiacum* Willd. Enum. Pl. 1029 (1809) ; Stapf. in Dyer, Fl. Cap. vii. 646 (1900). *Cynosurus aegyptius* L. Sp. Pl. ed. i. 72 (1753).
Ruwenzori : Katwe, salt lake region, 900 m., Dec. 1925, *M.* 1023.

Frequently found in various parts of Uganda in pure patches on gravelly soil, on paths and old cultivations. It does not appear to be much eaten by stock.

Oryza latifolia *Desv.* Journ. Bot. i. 77 (1813) var. **collina** *Hook. f.* Fl. Brit. Ind. vii. 93 (1896).
Masaka : Kaisi Forest, in ditches along roadside, 1140 m., Oct. 1925, *M.* 758.

This variety was originally described from Ceylon plants and it is the first record from Tropical Africa. In Uganda it is confined to damp forest and has also been found under somewhat similar conditions in the Bwamba Forests on the Congo side of the Ruwenzori. It is of little use for forage.

Leersia hexandra *Sw.* Prod. Veg. Ind. Occ. 21 (1788) ; Stapf in Dyer, Fl. Cap. vii. 659 (1900).
Entebbe region : 1150 m., Dec. 1922, *M.* 523. Busoga : Namwendwa, 1140 m., July 1926, *M.* 1401.

A grass of damp or aquatic situations. It forms a fairly good cover, but its aquatic requirements rather restrict its uses.

Streptogyne gerontogaea *Hook f.* in Trimen. Handb. Fl. Ceylon. v. 301 (1900).
Sese Islands : Damba Island, 1110 m., April 1925, *M.* 801.

A sparingly distributed forest grass, which has little importance as fodder. It has so far not been observed in other parts of Uganda.

Centotheca mucronata O. Ktze. Rev. Gen. Pl. 765 (1891). *Poa mucronata* P. Beauv. Fl. d'Oware, i. 5, t. 4 (1804).
Entebbe : Kitubilu region, 1150 m., Dec. 1922, *M.* 585.

An annual grass, found under forest or semi-forest conditions. It does not appear to be of much value for fodder.

Olyra latifolia *L.* Amoen. Acad. v. 408 (1759) ; Stapf in Dyer, Fl. Cap. vii. 746 (1900).
Victoria Nyanza region, *M.* 189.

A fairly frequent grass on the edge of and in forests of the Lake region. Its vegetative parts are hard and brittle and its uses as fodder are therefore somewhat restricted.

Leptaspis conchifera *Hack.* in Bolet. Soc. Brot. v. 211 (1887).
Entebbe : Oct. 1922, *M.* 171.

A common plant as forest undergrowth in the Lake region, where it forms almost pure stands over large areas. Its vegetative parts are hard and brittle and not attractive to stock.

Oxytenanthera abyssinica *Munro* in Trans. Linn. Soc. xxvi. 127 (1868). *Bambusa abyssinica* A. Rich. Tent. Fl. Abyss. ii. 439 (1851).
Mt. Elgon : Bulugenyi, 1350-1650 m., in forest, *Snowden* 1051.
Vern. Name : *Nkawo* (Luganda) ; *Madeza* (Lugishu).

A bamboo 20–30 ft. high, with solid culms 3–4 inches in diameter at the base (Snowden).

Centotheca mucronata O. Ktze. showing habit. A Spikelet (×4). B Lower glume (×7). C Upper glume (×7). D Lemma (×7). E Palea (×7).

XXXV.—PAPHIOPEDILUM AND PHRAGMOPEDILUM.

T. A. Sprague and V. S. Summerhayes.

At the present day the generic name *Paphiopedilum* (*Orchidaceae*) is applied by most authors to a group of Asiatic species represented by *P. insigne* (Wall.) Pfitz., but is used by Ames (Sched. Orch. ii. 2 : 1923) for an American genus commonly known as *Phragmopedilum* or *Phragmipedium*. It seems desirable, therefore, to determine the correct application of the name *Paphiopedilum*, and, if possible, the type species. The generic name was first proposed by Pfitzer in 1886 (Morph. Stud. Orchideenbl. 11) to include (1) a number of Asiatic species of which he mentions *P. insigne* (Wall.) Pfitz. and *P. spicerianum* (Rchb. f.) Pfitz., and (2) the species of *Selenipedium* Sect. *Acaulia coriifolia* Rchb. f. Three years later, when he validated the name *Paphiopedilum* by the publication of a generic description (Engl. & Prantl, Nat. Pflanzenfam. ii. Abt. 6. 84), he proposed two Sections : A. *Genuina*, including only Asiatic species, among them *P. insigne* ; and B. *Caudata*, including the American group *Selenipedium* Sect. *Acaulia coriifolia* Rchb. f.

Obviously the type species of *Paphiopedilum* Pfitzer must be one of the Section *Genuina* Pfitzer, and as *P. insigne* (Wall.) Pfitz. is the only species mentioned by Pfitzer in both works it may be regarded as the type.

In 1894 Pfitzer (Engl. Jahrb. xix. 40), proposed the sectional names *Coelopedilum* and *Phragmopedilum* in place of *Genuina* and *Caudata* respectively. Sect. A. *Coelopedilum* included 46 species from the Old World while Sect. B. *Phragmopedilum* comprised 15 species from Tropical America.

Rolfe in 1896 (Orch. Rev. iv. 331), raised Sect. B. *Phragmopedilum* to generic rank under the name *Phragmipedium*, recognising 10 species, and restricted *Paphiopedilum* to Sect. *Coelopedilum* (l.c. 363). In 1903 Pfitzer (Engl. Pflanzenr. Orch.-Pleonandr. 42, 54), accepted the new genus and applied the names *Paphiopedilum* and *Phragmopedilum* in precisely the same way, and in this he was followed by Schlechter (Die Orchideen, 27, 31 : 1915).

In 1912 Rolfe (Orch. Rev. xx. 2), pointed out that *Paphiopedilum* Pfitz. emend. Rolfe (1896) was antedated by the three generic names *Cordula* Raf., *Stimegas* Raf. and *Menephora* Raf. (all 1836), and adopted the first of these as the most suitable. In this he has been followed by Ames (Orchidaceae, vi. 6 : 1920). In view of the extreme rarity of Rafinesque's Flora Telluriana, in which these names appeared, it seems desirable to reproduce the original descriptions of the three genera, the words abbreviated by Rafinesque being spelt in full.

"933. Stimegas R. (stigma large) differt [a *Cypripedio*] petalis inaequalibus, superiore reniformi cucullato ; 2 interioribus ciliatis

cuneatis obtusis, labello pandurato basi cucullato apex calciforme, columna apex dilatata in stigma trilobo, antheris 2 ad basis lateralis. *Scapo unifloro, foliis radicalibus distichis.*—Type *St. venustum* R.; *Cypripedium venustum* Hook. Bot. Mag. t. 2129; Lindl. Bot. Reg. t. 788; foliis lanceolatis oblongis acuminatis canaliculatis enervis maculatis, scapo villoso. Fine species of Nepal, leaves with purple dots beneath, flowers varied of purple and green."

"934. CORDULA R. (nymph) differt petalo superiore fornicato emarginato, 2 lateralibus ellipticis undulatis, labello brevi saccato integro non fisso, columna obcordata sine appendice dorsalis, filamentis 2 pendulis antheriferis inaequalibus bilobis. *Scapo unifloro.*—Type *C. insignis* R.; [*Cypripedium insigne*] Hook. Exot. Fl. t. 34; Bot. Mag. t. 3412; Lodd. Bot. Cab. t. 1321; foliis ligulatis, scapo piloso, bractea oblonga obtusa flori aequali. Also from Nepal, large green flower with purple spots and veins."

"935. MENEPHORA R. (moon bearing) differt labello basi canaliculato apex auriculato saccato, appendice lunato. *Scapo unifloro.* Type *M. bicolor* Raf., foliis oblongis acutis maculatis, scapo pubescens, petalo superiore ciliato margine revoluto, ceteris oblongis undulatis. Borneo and Java, seen alive in gardens, flower dull purple but petal white, broader, ovate."

Under International Rules (Art. 46) Rolfe's choice of *Cordula* in preference to *Stimegas* and *Menephora* cannot be modified by subsequent authors, and it will replace *Paphiopedilum* unless the latter name is conserved. The case for its conservation is stated on page 309. Pfitzer, who had evidently not seen Rafinesque's Flora Telluriana, cited *Cordula*, *Stimegas* and *Menephora* erroneously as synonyms of *Cypripedilum*, having misinterpreted the entry in the Index Kewensis, in which *Cypripedium* was understood in a wider sense.

In his second paper Rolfe stated (Orch. Rev. xx. 1: 1912) that "Pfitzer originally based his genus [*Paphiopedilum*] upon the *Selenipedia acaulia coriifolia* of Reichenbach" and further on (l.c. 3) that the *Selenipedia* cultivated "are the *Selenipedia acaulia coriifolia* on which *Paphiopedilum* was primarily based by Pfitzer, and to which it had better be limited."

Apparently misled by these statements, Ames (Sched. Orch. ii. 2: 1923) has recently used the name *Paphiopedilum* for this group, that is, as synonymous with *Phragmopedilum*. But in the first place Pfitzer did *not* base *Paphiopedilum* either solely or primarily on the *Selenipedia acaulia coriifolia*; as has been shown above, he mentioned *P. insigne* and *P. spicerianum* as belonging to the genus, adding in a footnote that he also included the section in question. In the second place the effective publication of

Paphiopedilum dates from 1889, when he first supplied a generic diagnosis, and he then clearly indicated by the sectional name *Genuina* that he regarded the Asiatic species with unilocular ovaries as typical. Hence Ames's application of the name *Paphiopedilum* is inadmissible under the type-method, although it might be justified under the residue-method.

Some confusion has been caused by the fact that in many collections of living Orchids the name *Selenipedium* has been retained for the genus *Phragmopedilum*. *Prima facie* this application of the generic name *Selenipedium* might appear to be justified since *Phragmopedilum* coincides with Reichenbach's first section of *Selenipedium* and comprises eight out of his ten species. But as pointed out by Rolfe (Orch. Rev. iv. 366 : 1896), the generic name alludes to the small lip (*selenis*, a little crescent), and moreover, the character of having round crustaceous vanilla-like seeds mentioned in Reichenbach's diagnosis is restricted to his second section, that is, *Selenipedilum* Rchb. f. emend. Pfitz., which comprises only three species, *S. chica* Rchb. f., *S. palmifolium* (Lindl.) Rchb. f. and *S. isabelianum* Barb. Rodr.

The synonomy and principal references of the three genera in question are as follows :—

Selenipedilum *Rchb. f.* Xen. Orch. i. 3 (1854), partim, emend. Pfitz. in Engl. & Prantl, Nat. Pflanzenfam. ii. Abt. 6. 83 (1889) ; Pfitz. in Engl. Jahrb. xix. 39 (1894) ; Rolfe in Orch. Rev. iv. 331 (1896) ; Pfitz. in Engl. Pflanzenr. Orchid.-Pleonandr. 27 (1903) ; Schlechter, Die Orchideen, 23 (1915) ; Schlechter, Syst. Orch. in Notizbl. Bot. Gart. Berlin, ix. 582 (1926).
Selenipedium Series *Foliosae* Benth. & Hook. f. Gen. Pl. iii. 635 (1883).

Three species from Tropical America. Type : *S. chica* Rchb. f.

Cordula *Rafin.* Fl. Tellur. iv. 46 (1836) ; Rolfe in Orch. Rev. xx. 2 (1912) ; Ames, Orchidaceae, vi. 6 (1920) ; Ames in Journ. Asiat. Soc. Straits. Br., Spec. Vol. 135 (1921) ; Ames in Merrill, Enum. Phillipp. Fl. Pl. i. 253 (1924).
Stimegas Rafin. l.c. 45.
Menephora Rafin. l.c. 46.
Paphiopedilum Pfitz. Morph. Stud. Orchideenbl. 11 (1886), sine descr., partim ; Pfitz. in Engl. & Prantl, Nat. Pflanzenfam. ii. Abt. 6. 84 (1889), descr., partim ; Pfitz. in Engl. Jahrb. xix. 40 (1894), partim ; Hallier in Ann. Jard. Bot. Buitenzorg, xiv. 34 (1896), partim; emend. Rolfe in Orch. Rev. iv. 363 (1896) ; Pfitz. in Engl. Pflanzenr. Orchid.-Pleonandr. 54 (1903) ; Schlechter, Die Orchideen, 31 (1915) ; Schlechter, Syst. Orch. in Notizbl. Bot. Gart. Berlin, ix. 582 (1926).

47 species in Asia and New Guinea. Type : *C. insignis* (Wall.) Raf.

Phragmopedilum (*Pfitz.*) *Rolfe* in Orch. Rev. iv. 330, 331 (1896), (*Phragmipedium*) ; Pfitz. in Engl. Jahrb. xxv. 527 (1898) ; Pfitz. in Engl. Pflanzenr. Orchid.-Pleonandr. 42 (1903) ; Schlechter, Die Orchideen, 27 (1915) ; Schlechter in Fedde, Repert. Beih. vi. 46 (1919) ; l.c. vii. 207 (1920) ; l.c. viii. 111 (1921) ; l.c. ix. 119 (1921) ; l.c. x. 55 (1922) ; Schlechter, Syst. Orch. in Notizbl. Bot. Gart. Berlin, ix. 582 (1926).

Uropedium Lindl. Orch. Linden. 28 (1846), nomen rejiciendum (Internat. Rules, Art. 51, 3).

Selenipedium Sect. *Acaulia coriifolia* Rchb. f. Xen. Orch. i. 3 (1854). *Selenipedium* Series *Coriaceae* Benth. & Hook. f. Gen. Pl. iii. 635 (1883).

Paphiopedilum Sect. *Caudata* Pfitz. in Engl. & Prantl, Nat. Pflanzenfam. ii. Abt. 6. 84 (1889), excl. spp. asiat.
Paphiopedilum Sect. *Phragmopedilum* Pfitz. in Engl. Jahrb. xix. 41 (1894) ; Hallier in Ann. Jard. Bot. Buitenzorg, xiv. 44 (1896). *Paphiopedilum* Pfitz. emend. Rolfe in Orch. Rev. xx. 3 (1912), in obs. ; Ames, Sched. Orch. ii. 2 (1923), in obs. ; non Pfitz. emend. Rolfe (1896).

13 species in Tropical S. America. Type : *P. caudatum* (Lindl.) Rolfe.

The case for the conservation of *Paphiopedilum* versus *Cordula* may be presented as follows :

The name *Paphiopedilum* possesses the advantage of indicating the relationship of the genus with the other genera of *Cypripedilinae*, namely *Cypripedilum*, *Selinipedilum* and *Phragmopedilum*, whereas *Cordula* does not.

Paphiopedilum was adopted by Pfitzer in Engl. & Prantl, Nat. Pflanzenfam. (1889) ; and in Engl. Pflanzenr. (1903) ; Kerchove, Livre Orch. (1894) ; Hallier in Ann. Jard. Bot. Buitenzorg, xiv. 18-52 (1896) ; and by Schlechter, Die Orchideen (1915), and " Das System der Orchidaceen " in Notizbl. Bot. Gart. Berlin, ix. 582 (1926). It has been used also in the following floras : Forbes & Hemsl. Enum. Pl. Chin. (1903) ; J. J. Smith, Orch. Java (1905) ; Koorders, Exkursionsfl. Java (1911) ; Schlechter, Orch. Deutsch-Neu-Guin. (1911) ; Schlechter, Orch. Sino-Jap. Prodr. (1919) ; Ridley, Fl. Mal. Penins. (1924).

Many figures have been published under *Paphiopedilum* in the Orchid Review, Botanical Magazine, Orchis, and various horticultural journals, and none under *Cordula*.

Cordula has been adopted by Ames in the following works : Ames, Orchidaceae (1920) ; Merrill, Bibliogr. Enum. Bornean Pl. (1921) ; Merrill, Enum. Philipp. Fl. Pl. (1924).

The genus includes nearly 50 species, natives of Tropical Asia and New Guinea. Many species and hybrids are in cultivation.

XXXVI.—CONTRIBUTIONS TO THE FLORA OF BURMA: IV*.

Manglietia utilis *Dandy* [Magnoliaceae] ; affinis *M. Hookeri* Cubitt et Sm., sed alabastri spatha in pedunculum sub perianthii segmentis intervallo nullo inserta facile distinguenda.

A medium-sized *tree* ; branchlets glabrous in fruit ; leaf-buds appressed-shining-tawny-pubescent. *Leaves* oblanceolate-oblong to oblong, cuneate or obtuse at the base, acuminate at the apex, up to about 27 cm. long and 9 cm. broad, coriaceous, glabrous ; lateral nerves about 15–16 on each side of the midrib, not very prominent ; petiole up to about 3·5 cm. long, finally glabrous, with a scar on the upper surface reaching about $\frac{3}{4}$ of the way up ; stipules appressed-shining-tawny-pubescent outside. *Flowers* not seen. *Perianth-segments* 12 (from scars). *Fruit* ovoid-globose, cordate at the base after dehiscence of the mature carpels, about 9 cm. long.

Tavoy District, Nwalabo, about 3200 ft., fr. Dec., *R. N. Parker* 2320.

Parker states that the tree is known as " Sanga po " and is used for planks.

Michelia Baillonii *Finet et Gagnep.* [Magnoliaceae] ; *Magnolia Baillonii* Pierre ; *Talauma spongocarpa* King ; *T. phellocarpa* King ; *Michelia phellocarpa* Finet et Gagnep. ; *Aromadendron spongocarpum* Craib ; *A. Baillonii* Craib.

Katha District, Bilumyo Reserve, 1000 ft., fr. Aug., *C. G. Rogers* 987. Mandalay District, near Maymyo, 3500 ft., fl. July, fr. Aug., *J. H. Lace* 3284, *Badal Khan* 102, *Ba Pe* 1744, *A. Rodger* 77.

Also in Assam, S. Yunnan, Siam, and Indo-China. The species was originally described by Pierre as a Magnolia, but is correctly placed in *Michelia* ; in fact it is easily mistaken in the absence of fruit for *M. champaca* or *M. alba*. The fleshy syncarpous fruit is exceptional in the genus *Michelia*, and caused King to describe the plant in *Talauma* and Craib to refer it to *Aromadendron*. The numerous specimens now available show that King's *Talauma spongocarpa* and *T. phellocarpa* can no longer be retained as distinct from each other or from Pierre's species.—(J. E. Dandy).

Elaeodendron subrotundum *King* [Celastraceae].

Hitherto known from the Malay Peninsula and the Andamans, S. Tenasserim, Packchen River Forests, March, *C. E. Parkinson* 2060. " Small tree 8–15 ft. high in Mangroves. Flowers white."

Glyptopetalum quadrangulare *Prain* [Celastraceae].

Known from the Malay Peninsula only.

S. Tenasserim. Ngawun valley, 300 ft., Jan., *C. E. Parkinson* 1616. " Flowers brownish."

Vernacular name :—*Ka Mak* (Shan).

---

* Continued from *K.B.* 1927, p. 212.

Kokoona filiformis *Fischer* nov. comb. [Celastraceae]. *Lophopetalum filiforme* Laws.

Lawson had no fruit or seeds when describing the species ; as the seeds are long winged and exarillate, ovary 3-celled and the stigma faintly 3-lobed, it must fall in the genus *Kokoona*. As the fruits have not been described the description is appended.

Pedicels and stalk of fruit jointed, latter stout. *Capsule* 3-gonous, oblong, hardly narrowed upwards, bluntly apiculate, 9-10 cm. long, 2·5–3 cm. across, surface granulose. *Seeds* 6 in each cell, exarillate, semicircular, flat, wing oblong, rounded at the apex, with the seed 8–8·5 cm. long, about 1·8 cm. wide.

South Tenasserim, Browning Island, Victoria Point, at sea-level, March, *C. E. Parkinson* 2019. " Tree 30-40 ft. high. The outer bark burns readily when green. Flowers pale-yellow."

Vernacular name :—*Ja-Wee* (Malay).

Xerospermum ferrugineum *Fischer* [Sapindaceae].

Since the publication of the original description (*K.B.* 1927, p. 82) fruit and more advanced flowers have been received.

Stigma 2-lobed, lobes subulate, densely papillose. *Fruit* 2-lobed (or 1 suppressed), parts ellipsoid diverging, muricate, puberulous, 7 mm. long, 4·5 mm. wide. *Seed* oblong ellipsoid, more or less compressed, glabrous, 4 mm. long.

South Tenasserim. Nyaungbinkwin, about sea-level, Feb. *C. E. Parkinson* 1935. / " Flowers white."

Vernacular names :—*Kala Min Gyin* (Burmese), *Law Gaw Tan* (Karen).

Connarus Maingayi *Hook. f.* [Connaraceae].

Known only from the Malay Peninsula.

South Tenasserim. Victoria Island, at sea-level, March, *C. E. Parkinson* 2046. " A climber with very pale pinkish flowers."

Bauhinia Parkinsonii *Fischer* [Caesalpiniaceae].

Since the publication of the original description (*K.B.* 1927 p. 87) fruits have been received.

Legume oblanceolate, apex oblique, acute, terminated by at least a portion of the persistent style, tapering to an acute base, 4–6 cm. long, 1–1·2 cm. wide, valves smooth, glabrescent or sparingly pubescent, at first minutely yellow-glandular, the glands tending to disappear at length.

Mandalay District. Maymyo-Mandalay Road, 2500 ft. June, *C. E. Parkinson* 2077.

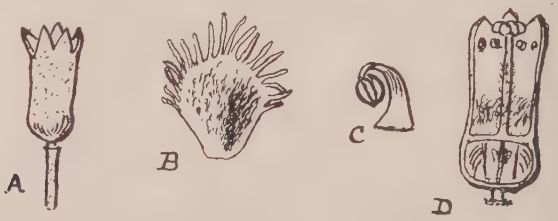
Vernacular name :—*Zi-Palau* (Burmese).

Pellacalyx Parkinsonii *Fischer* [Rhizophoraceae-Legnotidae] ; affinis *P. Sarcardiano* Scort., sed pubescentia foliorum membranaceorum florumque majorum et calyce 5-6-lobato differt.

Tree 60 ft. high ; branchlets round and somewhat corky, pale-brown ; twigs dark brown, sparsely pubescent with minute fascicled

hairs. *Leaves* membranous, elliptic, abruptly acutely cuspidate, base rounded or cuneate, 10–16 cm. long, 5–7 cm. wide, nearly glabrous above except the pubescent midrib, thinly white-hairy below, thinly white-ciliate, midrib impressed above; prominent and reddish-brown below, primary nerves 8 pairs, subprominent and reddish-brown below, ascending, arched, ultimate reticulations very fine, margin slightly undulate and distantly minutely apiculate; petioles pubescent 7–9 mm. long; stipules minute, triangular-lanceolate, densely pubescent. *Flowers* in axillary fascicles, 1–1·3 cm. long, white; pedicels puberulous with minute fascicled hairs, 6–7 mm. long, jointed below the flower with a ring of minute hairs at the joint. *Calyx* tubular 7–9 mm. long, minutely puberulous without, within densely villous at the base, glabrous above, lobes 5 or 6, thick, ovate lanceolate, half the length of the tube, keeled and glabrous within. *Petals* 5 or 6, at the mouth of the calyx tube, fleshy, suborbicular with a long fringe, minutely puberulous and shallowly keeled without, glabrous within, red. *Stamens* 10–12, inserted with the petals, minute; filaments broadly ensiform, incurved; anther subrotund. *Ovary* inferior, 3–4 mm. long, 10-celled, ovules many; style columnar, slightly exserted, puberulous below glabrous above; stigma capitate, flat, 10-lobed, minutely puberulous. *Fruit* not seen.

S. Tenasserim. Victoria Island, 200 ft., March, *C. E. Parkinson* 2051.



Pellacalyx Parkinsonii Fischer.

A Flower × 1½; B Petal, exterior aspect × 10; C Stamen × 5; D Section through flower × 2.

Jambosa pseudo-laeta *Fischer* [Myrtaceae]; affinis *J. laetae* Bl., sed foliis paulo longioribus, abruptius angustiusque acuminatis, nervis rectis primariis nervo marginali distincte angulatis, calycistubo petalisque majoribus distincta.

Large *shrub* or *small tree*; twigs slender, terete, smooth, pale-brown. *Leaves* chartaceous when dry, elliptic or ovate-elliptic, abruptly bluntly acuminate or subacutely caudate, base acute, 9–18 cm. long, 2·5–6·5 cm. wide, quite glabrous, dark-green and shining above, olivaceous below, densely pellucid-punctate, midrib and primary nerves impressed above, prominent beneath, primary nerves clearly horizontal, straight 10–12 pairs, occasionally with a more slender parallel one between uniting at a definite angle with a distinct looped marginal vein 2-7 mm. within the slightly

crenulate-sinuate margin, secondary nerve irregular, horizontal and variously curved, with a finer network between ; petioles channelled above, 3–5 mm. long. *Inflorescence* 3–5-flowered, terminal, trichotomous cyme shorter than the leaves ; peduncle very short ; petioles slender, jointed below the flower, 1·5–2 cm. long, lengthening in fruit. *Bud* globose above the narrowly funnel-shaped calyx-tube. *Flowers* large, glabrous, white or pink. *Calyx* 1·5 cm. long, funnel-shaped in flower, covered with glands, tube produced above the ovary, lobes subcoriaceous, hemispherical, about 5 mm. long. *Petals* suborbicular, densely glandular, about 1 cm. long. *Stamens* very many on a thickened stamial disk, 2·5–3·5 cm. long ; filaments slender ; anthers elliptic 1 mm. long. *Style* long, slender, overtopping the stamens by about 1·5 cm. Mature *fruit* not seen.

North Pegu. Thebyusan, Baingda Reserve, Jan. *Maung Ba Pe* per *C. E. Parkinson* 775 (type).

Tavoy, Zimba Valley, Nov. *R. N. Parker* 2244. " Shrub 2·5 m. high in dense evergreen forest Flowers white pendulous." (R. N. Parker).

Syzygium lineatum *Duthie* [Myrtaceae].

Known from the Malay Peninsula and Archipelago and possibly Siam.

S. Tenasserim. Maliwun, Victoria Point at sea-level, March, *C. E. Parkinson* 2035. " Tree 40 feet high. Flowers white."

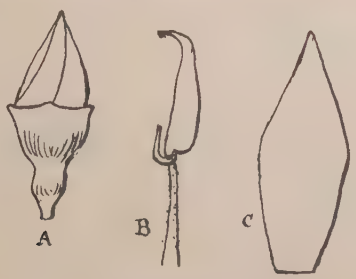
Vernacular name :—*Thabye* (Burmese).

There is also in the Kew Herbarium, a sheet of Helfer's collected in Tenasserim which appears to be this species.

Pachycentria tuberculata *Korth.* [Melastomaceae].

Known from the Malay Peninsula and Archipelago. S. Tenasserim, Mayinnge, Tenasserim River at sea-level, March. *C. E. Parkinson* 1998. " Epiphytic shrub. Petals white in the upper portions, orange red in the lower part ; branches of the inflorescence orange-coloured " (Parkinson).

The leaves attain to 16 cm. long and 6·2 cm. wide, and the petioles to 1·2 cm. long. The rhachis of the inflorescence, the pedicels, and calyx are covered with a fine yellow or orange meal.



Pachycentria tuberculata Korth.
A Bud × 4 ; B Stamen × 7 ; C Petal × 5.

Vernonia javanica *DC* [Compositae].

Known from Java and the Malay Archipelago.

Myitkyina District. Taungin, Mogaung, 1500 ft., March, *Saw Maung Mya* per *C. E. Parkinson* 2822.

Diospyros brachiata *King et Gamble* var. **atra** *Fischer* [Ebenaceae] ; a typo foliis floribusque majoribus et inflorescentiae indumento fusco differt.

The type has been reported from the Malay Peninsula. The leaves reach to over 30 cm. long and 10 cm. wide. The flowers are up to 1·6 cm. long, the calyx 0·7 cm. long. The indumentum of the inflorescence, calyx and corolla without is very dark brown, in places almost black. Only the ♂ flowers are present in the specimens received and no fruit. The flowers seem to be all 4-merous and not 5-merous as described for the type, but in the type sheets I find 4-merous flowers also present.

Tenasserim. Banks of the Tenasserim River at sea-level. Feb. *C. E. Parkinson* 1957. " Tree 50-60 ft. high. Flowers pale-yellow with black pubescence outside corolla " (Parkinson).

Litsea robusta *Bl.* [Lauraceae].

Known hitherto from Malay Peninsula and the Malay Islands.

Katha District. Namakyaing chaung, Petseit Reserve, 650 ft., April, *Maung Mya* per *C. E. Parkinson* 2333.

" Tree 44 ft. high, Flowers light yellowish " (Mg. Mya).

Griffiths 4326 (2 sheets in Herb. Kew.) from Burma are also this species.

Reidia gomphocarpa *Fischer* nov. comb. *Phyllanthus gomphocarpus* Hook. f. [Euphorbiaceae].

Known hitherto only from the Malay Peninsula.

S. Tenasserim. Kyeinchaung forest, 100 ft., Feb., *C. E. Parkinson* 1937. " Under shrub 2–3 feet high. Flowers yellowish " (Parkinson).

Ficus consociata *Bl.* var. **Murtoni** *King* [Moraceae].

Known from the Malay Peninsula and Archipelago.

S. Tenasserim. Victoria Island, at sea-level, March, *C. E. Parkinson* 2043. " A tree 30–50 ft. high. Figs yellow, sessile."

Quercus Kingiana *Craib* [Fagaceae].

Known from Siam.

Maymyo Plateau. Wakoye chaung, 3000 ft., Oct., *Maung Ba Pe* per *C. E. Parkinson* 3188. " Tree 30–50 ft. high."

Vernacular name :—*Wun-tha-bok* (Burmese).

In the ripe fruit the gland is half free. The interior surface of the cupule is densely grey-silky. The gland is depressed-globose or subglobose, glabrous except for the thinly silky apical depression and the short persistent styles.

XXXVIII.—MISCELLANEOUS NOTES.

The following appointments have been made by the Secretary of State for the Colonies :—Mr. G. W. St. C. Thompson to be Curator, Game Preservation Department, Tanganyika ; Mr. G. F. Clay, M.C., B.Sc., Agricultural Officer, Uganda, to be Geneticist on the Staff of the Amani Institute, Tanganyika.

We learn that Mr. Geoffrey Evans, C.I.E., M.A., has been appointed Principal of the Imperial College of Tropical Agriculture, Trinidad, in place of Dr. H. Martin Leake, who has resigned (*K.B.* 1924, p. 299).

Sir Harry Hamilton Johnston, who died at Woodsetts House, near Worksop, Notts, on the 31st of July, had long been a correspondent of Kew. He was born at Kennington, London, on the 12th of June, 1858, and educated at the Stockwell Grammar School and King's College, London. At first he intended to adopt a career as an artist and spent four years in the Royal Academy Schools, some of his pictures being exhibited in the Royal Academy. His artistic ability is shown in his water-colour drawings reproduced in his books mentioned below. In 1879 he visited Tunis to study art and architecture, and from this time onwards his life was connected more or less with Africa.

In 1882 he went to Southern Angola and extended his journey to the Congo, where in 1883 he met Stanley. The plants from this journey reached Kew in September, 1883, and he published his account of this tour under the title of " The River Congo." In 1884 under the combined auspices of the Royal Society and the British Association (chiefly through the influence of Sir J. D. Hooker), Johnston was appointed leader of an expedition to Kilimanjaro, one object of which was to study the subalpine flora, and in 1884 and 1885 he sent two collections from this region to Kew. This mountain had previously been climbed in 1861 and again in 1862, by Baron von den Decken, who once reached an altitude of 14,043 feet, and by the Rev. Chas. New in 1871. The collections of the last named formed the basis of a paper " On the subalpine vegetation of Kilima Njaro," published by Sir J. D. Hooker in the Journal of the Linnean Society (Botany), xiv. 141 (1875). During this expedition Johnston showed his resource by giving a display of fireworks, when the natives were hostile, and was thereafter known as the man who brought the stars down on his enemies. In 1886 he published his results in a volume " The Kilimanjaro Expedition."

In 1887 he sent to Kew the plants collected in the Cameroons, where he had been Vice-Consul, and in 1888 those from the Cross River Expedition. In 1888 he became Consul in Portuguese East Africa, and afterwards made a journey to the south end of Lake Nyasa, and it was at this time that a British Protectorate over

Nyasaland was proclaimed, over which Johnston was Commissioner and Consul-General from 1891 to 1897. Here, largely through his encouragement, large collections of plants were made by John Buchanan (Vice-Consul) and Alex. Whyte, and these have been enumerated in the various volumes of the "Flora of Tropical Africa," as well as by Mr. I. H. Burkill on pages 233–284 of Johnston's "British Central Africa." While in this country he met Cecil Rhodes.

In 1897 Johnston was Consul-General in Tunis, where outside official duties he devoted his attention to the study of Roman Ruins and of the Berber tribes.

Perhaps Johnston's chief work was accomplished in Uganda, where he went as Special Commissioner in 1899 and remained until 1901. Accounts of his administration and pacification of this region, which has now become an important asset of the British Empire and in which many Kew-trained men are now working, have been recorded elsewhere; but in addition he made valuable investigations into the natural history of the country, amongst them being the discovery of the Okapi and, with the assistance of Mr. W. G. Doggett, the vast collection of plants, which reached Kew in 1901. During this period he explored Ruwenzori and the Semliki Forest. On returning to England he wrote "The Uganda Protectorate," published in two volumes, one chapter being devoted to the botany, and pages 329–351 being occupied by a list, compiled by Mr. C. H. Wright, of all the plants then known from Uganda.

Johnston visited Liberia in 1904 and again in 1905-6, the outcome being another book in two volumes, to which Dr. O. Stapf contributed a list of the plants and Miss M. Smith twenty-four botanical drawings. With this Johnston's botanical work appears to have closed, and he devoted himself to writing novels and a book on the Bantu. In 1903 and 1906 he unsuccessfully attempted to enter Parliament as an advanced Liberal, and in 1908 he visited the United States and the West Indies.

Although of small stature, Johnston possessed vast energy, which enabled him not only to carry out great undertakings himself, but also to stimulate others to similar efforts. His work brought him many honours, amongst them being the C.B. in 1890, K.C.B. in 1896, G.C.M.G. in 1901, Doctorate of Science of Cambridge, and medals from many learned societies. C. H. W.

Charles Ford.—We learn with great regret of the death at the age of 83 of Mr. Charles Ford, I.S.O., for 32 years Superintendent of the Botanical and Afforestation Department of Hong Kong. His appointment in 1871 was on the recommendation of Kew, and it was one of Ford's chief objects all through his time in China to obtain fine and interesting plants from the neighbourhood of Hong Kong and to send them back in Wardian cases to the Royal Botanic Gardens, Kew. No better indication of the success of this part of his

work could be found than in the dedication to him by Sir Joseph Hooker of volume 50 (1894) of the Botanical Magazine because so many interesting and beautiful Chinese flowers introduced by him had been figured therein. The Hong Kong Gardens and the afforestation of the island practically grew up under his eye. It was in fact largely due to his remarkable enterprise and energy that the colony became such a pleasant place to live in. Among the many works of which he never lost sight was the establishment of a fine herbarium of Chinese plants which has been maintained in good condition up to the present time.

During the whole of his service he was in constant touch with Kew, the succession of his official letters was continuous and the annual exchanges of living plants, seeds and herbarium specimens show what was the centre of his horticultural and botanical aims.

S. T. D.

The Rev. John Roffey.—We regret to record the death of the Rev. John Roffey, which occurred suddenly on July the 1st while on a holiday at Riva-sul-Garda, Tyrol. Mr. Roffey graduated B.A. at Oxford in 1884 and proceeded to M.A. in 1888. Ordained in 1885, he became curate of Long Eaton, Notts, and after holding several clerical posts in the same county he came to London in 1894 and in 1924 became a Licensed Preacher in the diocese of Southwark, at the time of his death being attached to St. Alphege, Southwark.

Although he was a keen student of British plants, he published very little. Most of his work was done at the British Museum, but during recent years he has been a frequent visitor at Kew, where he was as recently as June 10th. His attention was concentrated chiefly on the genus *Hieracium*, of which he compiled the list of species for the 1925 edition of the London Catalogue, and in the Journal of Botany for the same year, pp. 315–322, he published critical notes on that list.

C. H. W.

Royal Botanic Gardens, Trinidad*.—The new illustrated Guide has been written by Mr. R. O. Williams, the Superintendent. In a brief Introduction he traces the history of the Gardens from their foundation in 1818. The general arrangement of the Guide is the description of each Section of the Gardens in turn, the principal trees and plants being mentioned together, with notes of general and economic interest.

The Sections are bounded by the principal roads through the Gardens, and by reference to the Key Plan at the end of the Guide the position of any plant or point of interest can be easily ascertained. From the site of "The Cottage," where Charles Kingsley in 1869-1870 wrote "At Last," many of the trees which he described can

* Guide to the Royal Botanic Gardens, Trinidad, by R. O. Williams, The Government Printer, Port-of-Spain, Trinidad, 1927. Pp. vi. 30, plates xii, map 1. Price 1s.

still be seen. The photographs give general views of the Gardens and also illustrate trees and palms of special interest. By means of the Index ready reference can be made to any particular specimen and its location, and the Guide will prove a useful companion to visitors.

Tree Euphorbias in South Africa as a Source of Rubber and Resin.—An article, entitled "Eenige opmerkingen over exploitatie van Euphorbia's in Zuid-Africa; winning van hars en caoutchouc" by Ir. W. Spoon*, which has recently been published in pamphlet form, gives an account of attempts in past years at commercial rubber-production from wild tree Euphorbias in South Africa and points out some of the difficulties that have to be faced. A large number of references to the subject including analyses and reports on Euphorbia rubber and resin are given in the opening pages.

The most important species referred to from the rubber-yielding point of view are *Euphorbia Tirucalli* L. (Natal chiefly), *Euphorbia Dregiana* E. Mey. (Namaqualand chiefly), *Euphorbia grandidens* Haw. and *Euphorbia tetragona* Haw. occurring chiefly in the Eastern Cape Province. It is interesting to note that a certain amount of preliminary experimental tapping has already been done, enabling conclusions to be formed as to the probable behaviour of the trees if run on plantation lines. It has been demonstrated, with *Euphorbia Tirucalli* for instance, that there is no wound response, consequently tapping cannot be carried out at short intervals. A suitable age for tapping is thought to be about five years and according to Noyes the system likely to give the best results is the "half herring bone." For this five or six oblique cuts spaced not less than nine inches apart and at an angle of 75 to the perpendicular cut should be made. For tapping ordinary tapping knives may be used, and as in *Hevea* care has to be exercised not to injure the cambium. Difference of opinion exists as to how frequently tapping should be done: forty times per year being one of the figures put forward. With regard to yield, Noyes estimates with *E. Tirucalli* an average daily yield of 20 lbs. of latex from 80 trees, which works out at 100 gms. of latex per tree per tapping. Tapping figures from the Kingwilliamstown (Cape) and Greytown (Natal) districts are given. From these it would seem that *E. grandidens* and *E. tetragona* may be expected to give a much higher yield than *E. Tirucalli*.

In sections 3 and 4 of the pamphlet the composition of latex and coagulum is discussed. One of the most striking features from the figures given is the high percentage of resin present in the latex of all the *Euphorbia* species investigated. The resin content is in fact generally several times greater than that of caoutchouc, and varies

* Berichten van de Afdeling Handelsmuseum van de Kon. Vereeniging Koloniaal Instituut. No. 32. Obtainable from Kon. Ver. Koloniaal Instituut (Centrale Boekerij), Mauritskade 62, Amsterdam.

as would be expected with different species. The proportion of resin to caoutchouc in *E. Tirucalli* is 11 to 2 and in *E. tetragona* and *E. grandidens* it is found to be about 3 to 1. The percentage of resin in a sample of latex from young trees (in the Transvaal) is given at 46 per cent. as against 29 per cent. for older trees from the same source. This suggests the interesting possibility of an abnormally high resin content being peculiar to young trees ; a problem which subsequent investigation will no doubt solve. The best coagulent, at least in so far as *E. Tirucalli* is concerned, is stated to be tannic acid. The working up of the coagulum, which is pale yellow or greenish in colour, to a commercial product is stated to present no very great difficulty. Methods whereby the resin can be separated from the caoutchouc are described and the advantages of effecting this separation in South Africa instead of exporting the crude coagulum are outlined. The Euphorbia resin is described as brittle, not altogether transparent, with colour varying from yellow to dark brown. Opinion differs considerably as to the commercial value of the resins. This may be due in a large measure to mixing of the latex of different species in the samples that have been reported on, as in many of the reports no indication is given of the species concerned and it is known that in many areas different rubber-yielding Euphorbias grow intermixed. With regard to the quality of the rubber, that from *E. Tirucalli* has on several occasions been reported to be poor and very much lacking in elasticity, but that of *E. grandidens* and *E. tetragona* is reputed to be superior and is considered by Ph. Schidrowitz to be worth from 70–80 per cent. of the value of first grade plantation rubber.

It is pointed out that owing to the uneven distribution of the trees and the fact that tapping can only be done periodically the factories or depots for receiving and working the latex would probably have to be transferred to new tapping areas from time to time. This, however, would not apply to the central factory dealing with the separation of the resin from the caoutchouc, which would be centralised. This factory would have more extensive mechanical installations and would need to be near a suitable water supply, and if possible cheap source of power. The companies which started exploitation of Euphorbia rubber during the period 1910-1915, and which proved unsuccessful exported their product in the form of crude coagulum (resin and rubber). It is the proposal of present undertakings to effect separation of resin and rubber in South Africa and therefore to market two distinct commodities. With the improved methods that have been devised since the earlier attempts in commercial production were made, it seems possible that greatly improved products should result. Naturally for success much will depend upon the quality of these products, the practical usefulness of which has not yet been fully demonstrated. F. N. H.

Genera of South African Flowering Plants*.—Until a few years ago botanists in South Africa were not very well provided with literature relating to their varied and interesting flora. Harvey's "Genera of South African Plants," the last edition of which appeared in 1868, was practically out of date, as well as the earlier volumes of the "Flora Capensis," a work only recently completed. In 1915, however, the English edition of Thonner's "Flowering Plants of Africa" was published, and proved a great boon to workers in Africa away from large herbaria. This contained in key-form descriptions of all the known genera of plants of the whole African continent, including North Africa and the Mascarene Islands. Dr. Phillips has now carried out a similar plan and has provided a book devoted only to the South African genera of flowering plants. In addition to the analytical keys, however, he has given a detailed description of each genus, thus rendering reference to other works unnecessary. The present volume is about equal in size and weight to Thonner's work, and will no doubt prove rather too large and heavy for general field work. In consequence it would appear desirable for the key-portion to be issued as a separate booklet.

The families and genera are arranged after the System of Engler and Prantl. Although the author states in his preface that the subdivision of the families into tribes follows the arrangement in the later volumes of the "Flora Capensis" and Bentham & Hooker's "Genera Plantarum," this is not the case with some families such as *Leguminosae*, *Euphorbiaceae* and *Gramineae*. For the benefit of students it would have been preferable to have followed either the one or the other system without modification.

Dr. Phillips has accepted *en bloc* and apparently without question the numerous genera separated from *Mesembryanthemum*† by Mr. N. E. Brown, so that South African botanists will now have an opportunity of observing whether they be tenable in the field. This question of *Mesembryanthemum* and its segregate genera will probably provide a battle-ground for Cape botanists for many years to come.

It is difficult in a book of this kind to avoid a certain number of misprints such as occur on p. 57, where *Brachiaria* is misspelt four times. Dr. Phillips deserves the thanks of all students of the flora of South Africa for this most useful book, the compilation of which must have involved a great amount of labour and patient research.

J. H.

* The Genera of South African Plants; by E. P. Phillips. Botanical Survey of South Africa, Memoir No. 10. Cape Times Limited, Cape Town, 1926, pp. 702. 20s. net.

† This is the original and correct spelling of the name, not *Mesembrianthemum*.

117) Wt. 23/10 1M 9/27 S.E.R. Ltd. Gp. 9.